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ANALYZING FINANCIAL STATEMENTS

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PREFACE

Formerly interest in the subject of analysis of financial statements was confined almost entirely to credit men. But of late years corporation executives, accounting officers, investors and public accountants have begun to appreciate the importance of statement analysis, and in this volume an attempt has been made to cover the subject from the broader viewpoint represented by the interests of all these various groups.

Surveying most of the existing literature on this subject the reader must be impressed with its vagueness as to method and technique of statement analysis, and as to the interpretation of the relative significance of facts which the analysis develops.

The author of this volume, while fully recognizing the grave dangers involved in definitely outlining methods and procedure, feels that a sharper focusing on the subject matter will be a help to those readers who have little time or inclination to study the pros and cons of each point.

Most of the procedure advocated has been in practical use by credit men for years. There are, however, some departures from the conventional treatment.

The trend percentage method which is advocated represents the application to statement analysis of the "index number method" which has long been used by statisticians. The application of this method to statement analysis is interesting, practical and of great value. While a thorough study of existing literature in this field fails to show that this application of index numbers has ever before been suggested or discussed, nevertheless the reader may feel entirely safe in using it. This method of statement analysis was submitted to several thousand certified public accountants

for their criticism and with practically no exception their replies indicated complete approval of the method, and, indeed, considerable enthusiasm over its possibilities.

Further, extensive tests covering many months and hundreds of balance sheets and profit and loss statements, definitely prove its simplicity, quickness and interpretive value.

Another innovation has been to point the analysis procedure toward certain specific business ailments, just as the physician's diagnosis points toward specific human ailments.

While only the two principal financial statements—the balance sheet and the profit and loss statement—have been discussed in this book, many of the methods advocated are generally applicable to various other exhibits, schedules and statistical statements.

It is recognized that a volume several times this size might be written to cover the analysis of internal business statements, departmental reports and statistics, etc. However, it was found necessary to draw a rather sharp line of distinction between the internal and external viewpoints and with but few necessary exceptions the external viewpoint has been consistently maintained throughout.

In almost all instances fictitious instead of actual names of corporations have been used in illustrative statements. Otherwise, with but few unimportant changes, these illustrations represent actual cases.

Complete and grateful acknowledgment is due my father, Stephen W. Gilman, LL.D., C.P.A., and to my dear friend and associate, John B. Tanner, C.P.A., for their careful reading of the manuscript and many helpful criticisms and ideas. And to a host of certified public accountants who offered important suggestions, much appreciation is due.

STEPHEN GILMAN

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Analyzing Financial Statements

CHAPTER I

THE FIELD OF STATEMENT ANALYSIS

The Language of Business.—"The language of business is figures."

In this forceful yet simple manner C. W. Patterson, president of Austin, Nicholls and Company, of New York City, the largest wholesale grocers in the world, has uttered a statement peculiarly striking because of the vital thought expressed in those few words.

For it is literally true that the language of business is figures. Business men write, talk and think of every phase of commercial activity in terms of figures. Financing, purchasing, producing, selling and the subdivisions of these activities form a complex structure which can only be recorded, discussed and understood when translated into the language of figures—usually dollars and cents.

The History of a Business.—Practically every business keeps a written record of its financial activities; and this is particularly true in this country where the requirements of the income tax laws during recent years make the keeping of such records mandatory.

But even before the requirement by law, and even where such requirements do not exist from a legal standpoint, business men have recognized the indispensable value of such a written history in the carrying on of their commercial activities.

The history of any business is recorded in its accounting books and records, expressed in terms of figures and for the greater part expressed in the terms of money.

Origin of Accounting.—Accounting originated, no doubt, in the keeping of what was a mere chronological list or record of business happenings, or a diary of business transactions,

scarcely comparable with the intricate, carefully built accounting systems of today; but still a written record of the business activities.

Double Entry Records.—Accounting has kept pace with the tremendous strides of industrial activity and has developed into a definite procedure known as “double entry.”

While this procedure as used by a particular enterprise may appear to be very much different from the procedure used by some other enterprise, nevertheless all double entry systems are based on certain fundamental principles which are the same for every business.

The Financial Statements.—Of these fundamentals of procedure, probably the most important is the ultimate goal of double entry account keeping, which is the production of two financial statements, known as the balance sheet and the profit and loss statement, respectively.

They represent the end toward which the double entry system is constantly working and toward which the whole of the double entry machinery is directed.

This does not mean that the production of these two statements is the sole purpose of double entry accounting, for there are a number of other results which are obtained from the procedure; but it may be said that the production of these two statements is the foremost purpose since the fundamental structure of the procedure is planned toward their preparation.

In this book the double entry accounting system will be viewed only as a means to an end, and attention will be given to this principal result of accounting, the balance sheet and the profit and loss statement, rather than to the methods of account keeping and the various procedures and devices which are used to accomplish the result.

Description of Statements—The Balance Sheet.—Chief consideration, then, will be given to these two statements, the

producing of which is the principal purpose of double entry accounting:

1. Balance sheet.
2. Profit and loss statement.

While the name "balance sheet" is the one generally accepted and generally used to designate the first of these two statements, and while it is the name which will be used henceforth in this volume, yet there are several other names by which the statement is sometimes known, one of which may be more familiar to some readers than the term "balance sheet." Sometimes this statement is spoken of as a "statement of assets and liabilities;" sometimes it is called a "statement of resources and liabilities;" and sometimes it is referred to as merely a "financial statement."

From a technical standpoint, distinctions might be made between these various names, but from the popular understanding the names are practically synonymous. However, the technically correct name for the statement produced by double entry accounting, "balance sheet," has come into such general use in recent years that probably everyone will recognize it readily as the statement showing financial position.

The Profit and Loss Statement.—Other names have often been used, too, in referring to the profit and loss statement.

Such names as the "Income account" or "income statement," the "loss and gain statement," or the "trading and profit and loss statement," are often heard and are in more or less general use in business today.

Perhaps "trading and profit and loss statement" is the most accurate of these, but it is a cumbersome phrase and for that reason no doubt has been largely abandoned for the shorter and more convenient phrase "profit and loss statement."

This short title has not only gained rapidly in favor among business men and accountants, but it has also received a some-

what official sanction through its use by the Federal Reserve Board in an important accounting monograph prepared by that Board in conjunction with the Federal Trade Commission on the subject of "Approved Methods for the Preparation of Balance Sheet Statements."

Grouping of Balance Sheet Items.—The balance sheet is a statement which exhibits the values that a business owns, the amounts the business owes, and the difference, or net worth—all expressed in dollars and cents.

Usually the values are grouped in such a way that similar items are classed together in one item, so that one description and one amount on the balance sheet cover the total of all values of a certain class.

For example, a company may have several different bank accounts, but for the balance sheet these may all be added together and the total shown as one item on the balance sheet described as "cash in banks."

Similarly, each machine is not listed on the balance sheet, but all the machinery values may be added together and shown on the balance sheet as one item described as "machinery."

In a like manner, those who owe money to the company for goods purchased on open account are not listed on the balance sheet, item after item and name after name, but all such values are added together and are shown as one item on the balance sheet described as "accounts receivable."

The balance sheet should include every financial item which belongs to the business, and it should show every legal claim and debt against that business. It is a statement of ownership that conveys to the reader the measurement of the wealth of the particular enterprise.

Nature of Profit and Loss Statement.—The profit and loss statement presents a story of the business transactions during some certain period of time.

In the same manner that the balance sheet shows groups of items, so does the profit and loss statement exhibit the transactions that have occurred, in totals of classes of transactions.

For example, each sale that has been made is not shown separately, but all the sales, expressed in monetary value, may be added together and shown on the statement as one item, called "sales."

Similarly, the amount of profit resulting from the difference between the amount of money paid for an article and the amount of money received for the article, is not set down item by item for each sale, but total figures are accumulated for sales, cost of goods sold, and gross profit, and they may appear in the statement as three items, described by their respective names. Sometimes these items may be so grouped as to show each one of the three by departments, branches, or some other division of the business.

In addition to the sales, cost of goods sold, and gross profit, the profit and loss statement presents the expenses and the final figure of net profit. The transactions representing expenses are not set down item by item, but are usually classified so that expenses of a like nature are grouped together and presented as a single item; and other expenses of a like nature but different from the first group, will be grouped in another total figure and presented as another single item.

The resultant figure of the statement is the net profit resulting from the transactions of the period.

The work of accumulating like transactions into groups is not deferred until the time when the statement is to be prepared but is carried on continuously through the means of the accounting system, which is designed to effect these accumulations by the means of its various accounts.

From these accounts are taken the total figures, which have been accumulated, for the purpose of preparing the balance sheet and the profit and loss statement.

Frequency of Statement Preparation.—Some companies prepare these statements only once a year, at the time when the fiscal year ends; other companies prepare them semi-annually; others prepare them quarterly; and many companies prepare them at the end of each month.

Usually the monthly statements are not issued for publication but are used by the directors and managers in connection with the conduct of the business.

Relation of the Two Statements.—These two statements, the balance sheet and the profit and loss statements, are somewhat in the nature of complements.

Neither standing alone is sufficient to furnish a real grasp of the financial situation; but the two together give a completed viewpoint in respect to a given period.

The distinction between these two statements is both interesting and important.

The balance sheet shows the condition of the business at the end of the period, exhibiting the values which the company owns, the liabilities which it owes, and the net worth which belongs to the company above its indebtedness. The profit and loss statement shows the transactions during the period, exhibiting the income, costs and expenses.

S. F. Brewster in his book, "Analyzing Credit Risks," gives an excellent illustration of the inter-related character of these two statements:

The difference in the situation reflected in these two statements (the balance sheet and the profit and loss statement) has been likened unto the measurement of the contents of a tank of water from time to time. Assuming an inflow and an outflow pipe, changes in the volume of the water may be determined either: (1) By comparing the actual level of the water (the actual amount of the net worth) for different periods; or (2) by comparing the total inflow (income from all sources) with the total outflow (all costs and expenses).

The quotation is not exact since the explanatory parenthetical phrases have been inserted for clearness.

J. H. Bliss, in "Financial and Operating Ratios in Management," says:

A complete grasp of the situation of a business is obtained only by the use of both the income statement and balance sheet.

These two statements, then, being almost universally used and forming the fundamental ground-work of an understanding of the financial condition of any business, will furnish the material for chief consideration and examination in this volume on analysis of financial statements. Attention will not be centered in the mechanical means and methods by which the figures are collected and the statements prepared, but in the methods of interpreting and analyzing the information furnished by the statements themselves.

Knowledge of Accounting a Prerequisite.—While one who has only a meager knowledge of the preparation of the statements may secure a good understanding of the methods of analysis and interpretation, nevertheless it is desirable that the analyst have a general knowledge of the meaning of accounting terms, the general principles of double entry books, the flow of figures through the journals to the ledger, the generally accepted rules of valuing assets, the nature of depreciation, obsolescence, reserves, accruals, deferred and prepaid expenses, etc., and for the purpose of this book the reader is assumed to be possessed of such knowledge.

Necessity for Statement Analysis.—In approaching the discussion of any subject similar to the one dealt with in this book, it will usually be found desirable to build a foundation by considering the purpose of the activity, why it is undertaken, and by whom it is undertaken; so it is appropriate first to outline the purpose of statement analysis, and consider the reasons for making such analysis.

The purposes of statement analysis may be outlined as follows :

1. To determine the desirability of :
 - a. Loaning money to an organization.
 - b. Extending trade credit to an organization.
 - c. Buying stock in an organization.
2. To measure the management efficiency of an organization.

Bankers, commercial credit men, and prospective stock and bond buyers are concerned with statement analysis for the purposes stated in the first group; while managers, owners, present stockholders, present bondholders and the accountants who serve them are concerned with statement analysis for the purpose stated in the second group.

An Important Point.—No doubt among the readers of this book there will be many who are in the first group and for that reason it is important to direct attention to a simple but significant point that many writers on this subject have overlooked.

Ordinarily the banker, credit man and investor are furnished with the financial statements in respect to the organizations in which they are interested, but usually they are given no opportunity to verify the truth of the figures. It is usually necessary, therefore, for them to proceed on the assumption that the figures are true if the statements are to be of any value whatever.

Untrue Statements.—Of course, such an assumption carries with it an element of danger, for the figures may be incorrect.

The statements may have been wilfully “doctored” for the very purpose of conveying false impressions in respect to the organization’s condition; or, on the other hand, the statements may have been innocently distorted because of ignorance or

negligence in their preparation or in the accumulation of the figures which enter into them.

In either event the result is the same for the banker, credit man or investor who has proceeded upon the assumption that they are true statements and has secured a false impression from them.

Safeguarding Against Misrepresentation.—Such misrepresentation would be revealed by an audit of the books and records from which the statements were prepared, but usually the banker, credit man or prospective investor is not in a position to require such an audit.

For that reason the matter of the truthfulness of statements will be covered very briefly in this chapter, and in the remainder of the book it is assumed that all statements as presented have been properly and truthfully prepared and that they accurately reflect the condition of the business at the time of their preparation.

In considering, studying or analyzing any financial statement one should always be watchful in regard to the possibility that it may contain distorted statements or incorrect figures. "Who prepared this statement and what motive might he have for distorting it?" are questions that one may well ask himself whenever he is studying or analyzing a financial statement. Often he will find his question answered by the fact that the statement has been certified by certified public accountants (and reputable appraisers in some cases).

C. P. A. Certification.—Such a certificate gives a sound basis for accepting the facts and figures shown as being true and correct, for while there are isolated cases of certified public accountants who have been careless in their work, such cases are so few as to be negligible; and the certificates of the recognized appraisal companies can also be accepted unhesitatingly.

Qualified Certification.—Of course, it is always wise to read the certificate carefully, for certified public accountants are often called upon to make audits which do not cover all phases of the business.

When this is done, the accountant qualifies his certificate accordingly in order that the reader may know what items of the financial statement he has verified and what items he has not investigated or has investigated only to a certain extent.

For example, the auditor may qualify his certificate by stating that the inventory is based on certificates from employees of the client, which means that the auditor has not verified the inventory personally (or through his own employees), but instead has accepted the written testimony of employees of his client as to the correctness of the inventory.

It should always be borne in mind that a certified public accountant accepts responsibility only to the extent of his certificate, and that the qualifications and exceptions which he states in his certificate are put there for the purpose of conveying to the person reading the statement the exact extent of the accountant's verification of the facts and figures.

Important Credit Factors.—The facts reflected by statement analysis are by no means the only ones required for a well-rounded consideration of the granting of credit or the investment of funds.

Other factors are of considerable importance and should be given due weight along with the financial statements.

The Four Factors.—Four credit factors have come to be generally accepted as of primary importance in connection with matters of credit. They are as follows:

1. Character—honesty, habits, etc.
2. Capacity—business ability and astuteness.
3. Capital—financial condition and earnings.
4. Conditions—general business situation.

Thus, the most favorable statement analysis would seldom justify entrusting funds or goods to a crooked organization, or to an incompetent organization, or, except under special safeguards, to any organization at a time of severe financial panic.

The factors of (1) character, (2) capacity and (4) conditions are of prime importance. However, their consideration does not come within the scope of this volume except in so far as the methods of statement analysis do bring to light facts relating to the competence of management.

How statements reflect managerial ability will be discussed in later chapters.

CHAPTER II

THE BALANCE SHEET

The Balance Sheet Equation.—In its simplest form, a balance sheet conforms to this equation:

$$\text{Funds} = \text{Source of Funds}$$

For the purpose of illustration, assume that the Ames Manufacturing Company (which is, of course, a fictitious name) had total assets amounting to \$78,328 on December 31, 1924. Then, the most simplified method of expressing this fact in balance sheet form would be:

THE AMES MANUFACTURING COMPANY
BALANCE SHEET
As of December 31, 1924
Funds, \$78,328 = Source of Funds, \$78,328

Since the term “funds” is commonly considered to indicate cash or its equivalent, while the term “assets” conveys a broader meaning of value, the latter term will be better for use in considering financial analysis.

Classification of Assets.—The assets of the Ames Manufacturing Company may consist of a number of different kinds of values. For example, let us assume that these different kinds of values are as follows:

Cash.....	\$10,512
Accounts Receivable.....	5,857
Inventories.....	22,210
Fixed Assets.....	37,290
Prepaid Expense.....	2,459
Total Assets.....	<u>\$78,328</u>

These, then, are the assets which the Ames Manufacturing

Company had under its control on December 31, 1924, and which it might use in any way that it desired.

Sources of Funds.—And now comes the question presented by the other side of the equation: From what source did the Ames Manufacturing Company secure the funds with which it was enabled to hold these values?

Usually the source of funds or assets is twofold: (1) Contributed by the owners, and (2) contributed by creditors. Here is an important division, because funds contributed by the owners represent their permanent investment in the business, being equivalent in many respects to a loan with no definite specified date for repayment, whereas funds contributed by creditors are legal obligations which must be met within a specified time.

In order to carry out the illustration of the Ames Manufacturing Company's balance sheet in figures, assume that this division of the source of funds as of December 31, 1924, is as follows:

Contributed by Creditors.....	\$10,248
Contributed by Owners.....	68,080
Total.....	<u>\$78,328</u>

Liabilities.—The funds contributed by creditors are known as liabilities and may be based on many different kinds of transactions, of which the following are ordinary examples: Merchandise credit extended, usually described as "accounts or notes payable;" money loaned by banks, usually described as "notes payable;" dividends declared but not yet paid, in which instance the stockholders become creditors to the amount of the dividend owing them; accrued amounts which are not yet legally due, but for which the benefit has been received, such as payroll, interest, etc.

Classification of Liabilities.—The list of examples does not by any means include all the different kinds of possible

items that may be found under the classification of liabilities; but it will serve as a basis for developing the illustration of the Ames Manufacturing Company's balance sheet.

The following list of items may be taken as making up the total of funds contributed by creditors:

Notes Payable—Trade.....	\$ 1,000
Notes Payable—Bank.....	2,000
Accounts Payable.....	5,000
Dividends Payable.....	2,000
Accruals Payable.....	248
Total.....	<u>\$10,248</u>

Net Worth.—The funds contributed by the owners usually arise from two sources: the amounts put into the business as investments, and profits that have accumulated and have not been withdrawn.

In the case of businesses operating under the corporate form of organization, the amounts put in as investments are usually represented by the capital stock outstanding, and the accumulated profits that have not been withdrawn are usually represented by the surplus.

Both of these items can be classified in the balance sheet under the group name of "net worth," and frequently the sum of the two is described as "net worth."

Classification of Net Worth.—In order to complete the illustration of the balance sheet of the Ames Manufacturing Company, certain figures may be assumed to represent these divisions, as follows:

Capital Stock Outstanding.....	\$50,000
Surplus.....	<u>18,080</u>
Total Net Worth.....	<u>\$68,080</u>

The Complete Balance Sheet.—This completes the development of the equation of the Ames Manufacturing Company's balance sheet as of December 31, 1924, and the balance sheet may now be shown in more detailed form by substituting

the details for the single figures of \$78,328, shown in the first equation:

THE AMES MANUFACTURING COMPANY

BALANCE SHEET

As of December 31, 1924

<i>Assets</i> (Funds)		<i>Liabilities and Capital</i> (Sources of Funds)	
Cash.....	\$10,512	Notes Payable—Bank.....	\$ 1,000
Accounts Receivable.....	5,857	Notes Payable—Trade....	2,000
Inventories.....	22,210	Accounts Payable.....	5,000
Fixed Assets.....	37,290	Dividends Payable.....	2,000
Prepaid Expense.....	<u>2,459</u>	Accrued Liabilities.....	248
		Capital Stock Outstanding.	50,000
		Surplus.....	<u>18,080</u>
Total.....	<u>\$78,328</u>	Total.....	<u>\$78,328</u>

Liabilities vs. Net Worth.—This form of statement does not bring out the distinction between the funds contributed by creditors and funds contributed by owners.

This distinction is of vital importance because of the difference existing between the bases on which these funds are contributed, namely, that creditors should be repaid at a specified definite date, while the investor's contributions may be held in the business so long as they are needed for the proper and legal purposes of the corporation.

For that reason it is usually considered better to draw up the balance sheet in such a way as to show the total of the liabilities (funds contributed by creditors) and the total of the net worth (funds contributed by owners).

Form of Balance Sheet.—In the form of balance sheet which follows, provision is made to show these important totals.

This form of balance sheet also presents the advantage of being more convenient for typing and printing, since the liabilities and capital appear below the assets instead of opposite

them, thus furnishing space for more detailed descriptions when they are needed.

In this balance sheet the phrases "funds" and "source of funds" are not used.

These phrases do not usually appear in balance sheets and consequently they will not be used from now on, but it should be understood that the meaning is there even though the phrases themselves do not appear. The use of these phrases is an important step in developing the theory of the balance sheet and represents the viewpoint from which a balance sheet should always be considered. But the words themselves are never found as part of the statement.

THE AMES MANUFACTURING COMPANY

BALANCE SHEET

As of December 31, 1924

<i>Assets</i>	
Cash.....	\$10,512
Accounts Receivable.....	5,857
Inventories.....	22,210
Fixed Assets.....	37,290
Prepaid Expense.....	<u>2,459</u>
Total Assets.....	\$78,328
<i>Liabilities and Capital</i>	
Notes Payable—Trade.....	\$1,000
Notes Payable—Bank.....	2,000
Accounts Payable.....	5,000
Dividends Payable.....	2,000
Accruals Payable.....	<u>248</u>
Total Liabilities.....	<u>10,248</u>
Net Worth.....	\$68,080
Represented by:	
Capital Stock Outstanding.....	\$50,000
Surplus.....	<u>18,080</u> <u>68,080</u>

The items shown in this balance sheet present interesting material for consideration and deserve a brief discussion.

Arrangement of Assets.—The assets have not been set down without regard to a logical order of arrangement, but

a definite plan has been followed, a plan which has grown out of accounting practice over a long period of years, until it has come to be recognized as a proper arrangement of the assets for balance sheet presentation.

It is not the only plan of arrangement which has been approved by accounting practice, but it has met with wide-spread favor for all uses, and is strongly advocated for statements used for credit purposes.

Determining Sequence of Items.—The assets have been set down in the order in which they may be expected to be converted into cash; in other words, in the order of their “cashability,” to coin a word for the expression of this meaning.

Following this plan the first item, quite logically, is cash itself.

The second item, accounts receivable, represents legal claim to cash, which in the ordinary and regular course of business will be realized in cash within a short time.

The next item, inventories, represents, for the most part, merchandise which is being held for sale. Normally it will be sold and thereby converted into accounts receivable and then into cash.

The fixed assets, consisting of such assets as land, buildings, machinery, furniture, fixtures, etc., is not held for sale, but for use; and under normal regular business operations will not be converted into cash at all, although it should be borne in mind that any of these items might be converted into cash because of unusual conditions.

The last item, prepaid expense, usually represents the least cashable asset of all, since in the normal course of business it will never be converted into cash but will be charged off as expense during some future period.

Current Assets.—In a going business, the first three items, cash, accounts receivable, and inventories, are constantly active

in a process of continuously changing from one form of asset into another.

Cash is spent to secure merchandise; the merchandise is sold and an account receivable is created; the account is collected and cash takes its place; the cash is spent for more merchandise, and the cycle starts again.

This common group characteristic puts these three forms of assets into a class by themselves; and the name usually given to this group is "current assets."

Analysis of Current Assets.—But even within this group there is a distinction of prime importance in connection with the business operations.

An account receivable represents a legal claim to cash and will normally be converted into cash; but inventories do not represent a legal claim to an account receivable. There is a decided break in the chain at this point, and at this break is directed one of the most vital of the business activities.

Importance of Selling.—The important step between inventories and accounts receivable is the sale, the activity of selling the company's merchandise.

Selling must be done before merchandise is converted into receivables.

By the mere passage of time most of the accounts receivable naturally and automatically are converted into cash; but the process of converting merchandise into a receivable is not a mere automatic process, but calls for the highest expenditure of effort and money in the activity of selling.

The importance of this distinction to the analyst cannot be emphasized too strongly, for companies which show equally good position when viewed as to total current assets, may show a decided difference in desirability as credit risks due to a difference in the division of these current assets between the three items comprising the group.

This will be quickly recognized from the following example illustrating how two companies may show such conditions:

Two companies, company A and company B, show balance sheets with identical figures except for the differences in the amounts of accounts receivable and inventories.

	Company A	Company B
Cash.....	\$ 1,000	\$ 1,000
Accounts Receivable.....	5,000	10,000
Inventory.....	10,000	5,000
Liabilities.....	10,000	10,000

Comparing the Credit Risk.—Both of these companies show total current assets amounting to \$16,000 and liabilities amounting to \$10,000; and yet if one were called upon to decide which presents the better credit risk, the proper choice is quite evident.

Company B, on the basis of these figures, presents the better condition from a credit viewpoint, for it can pay all of its liabilities out of cash plus the proceeds of its receivables and still have \$1,000 left; whereas company A would have \$4,000 of its liabilities left unpaid if it applied all of its cash and accounts to this purpose.

Merchandise cannot be used to pay bills. It must be sold before it represents a claim to cash, and selling is often an expensive and uncertain gamble.

Quick and Working Assets.—The importance of this distinction between cash and receivables on the one hand and inventories on the other has led to the practice of introducing two group titles as subdivisions of current assets, as follows:

Quick assets (cash and receivables).

Working assets (inventories).

Fixed Assets.—Those items of the balance sheet that represent fixed tangible plant are grouped together usually under some appropriate heading such as “fixed assets” or “plant and equipment.”

Other Asset Groups.—In addition to these standard asset groupings which have already been discussed, there will frequently be found other items such as :

Prepaid expense	Patents
Deferred charges	Franchises
Copyrights	Goodwill

Of course, this list does not include all items which might be found on balance sheets, but it includes those which are common to many balance sheets and for that reason deserve at least a brief consideration.

PREPAID EXPENSES.—The title of “prepaid expenses” well indicates the nature of the items included under this heading, for it represents expenses which have been paid for in advance, but for which the service has not been used as of the date of the balance sheet.

When the service for which such an expenditure has been paid is rendered, the items cease to exist as assets and consequently disappear from the balance sheet.

Under this classification are grouped such items as prepaid insurance, prepaid advertising and prepaid rent.

DEFERRED CHARGES.—Deferred charges, on the other hand, represent costs of service already received, which for good accounting reasons are not to be charged into the expense of one month or year, but are to be spread in instalments over a number of such periods. An example of such an item is the expense of organizing or starting a business.

INTANGIBLE ASSETS.—The other items mentioned in the list, copyrights, patents, franchises and goodwill, fall within the group which is usually known as “intangible assets.”

They are often of the utmost importance to the company which possesses them, being the very foundation of the structure upon which the company is built.

For example, the manufacturing company producing a dis-

tinctive product the basic idea of which is protected by patent, holds a peculiarly valuable position if this product is in demand and can be produced and sold at a satisfactory profit.

Proof of Value.—This last qualification presents the aspect of intangible assets which should receive the careful consideration of the analyst, for if the patented product is being produced and sold at a satisfactory profit, that fact should be reflected in the company's profit and loss statements, and if properly administered, in the tangible values shown on the company's balance sheets.

In other words, if the patent is valuable, that value should be evidenced by having produced tangible values either left in the business or withdrawn as cash dividends. So from the analyst's viewpoint balance sheet values placed on intangible assets have little meaning and are usually of little significance.

Types of Liabilities.—The balance sheet of the Ames Manufacturing Company does not exhibit all types of liabilities which may be found in balance sheets, for there are other types that are not at all unusual.

Such liabilities as mortgages (often in the form of bonds), and debentures (which are equivalent to long-time promissory notes), are often found on balance sheets and should receive special consideration. They differ from the liabilities already mentioned because they provide that a long period of time from the date of issuing them—in many cases 10 years or more—must pass before they become due and payable.

Long-Time vs. Current Liabilities.—It is quite evident that the distinction between such long-time obligations, also called "funded," "fixed" or "permanent," and the short-time obligations, usually called "current liabilities," becomes a matter of exceeding importance in analyzing a balance sheet.

Liabilities which must be met within a short time from the date of the balance sheet must be provided for in cash or

its immediate equivalent, whereas long-time liabilities do not present the necessity of making provision for early payment.

The following example will serve to illustrate the point involved in connection with this distinction between these two types of liabilities:

The balance sheets of two companies, which are designated as company C and company D, present identical figures except as to the kind of liabilities.

	Company C	Company D
Current Assets	\$50,000	\$50,000
Current Liabilities	10,000	40,000
Long-Time Liabilities	40,000	10,000

Comparing the Credit Risks.—In looking over these figures from the balance sheets of these two companies, it is observed that both show total liabilities equal in amount to the current assets.

But if the relative financial positions of these two companies be weighed from the viewpoint of credit risk, it is evident that company C is much the better risk; for if its current creditors all press for payment at one time, ample current funds are available.

On the other hand, if all the current creditors of company D press for payment at one time, the company might find it difficult to secure \$40,000 in cash out of its current assets of \$50,000, a substantial part of which probably consists of receivables and merchandise. Company D is largely at the mercy of its current creditors and is, therefore, the less desirable credit risk.

Balance Sheet Grouping—"One Year Rule."—Because of the importance of the distinction between these two kinds of liabilities, it has become customary to subdivide total liabilities into two groups for the purpose of presenting them on the balance sheet. These two groups are:

Current liabilities

Long-time liabilities

Of course, it is necessary to formulate some rule as to the length of time which will mark a liability as belonging to the one group or the other.

Such a rule will, of course, be arbitrary, and consequently it is impossible to find a rule which will be universally considered as satisfactory. However, the rule which has gained the widest acceptance is to include in the first group all liabilities which must be paid in less than a year and in the second group all those of longer maturity.

C. B. Couchman in his book, "The Balance Sheet," comments on this point as follows:

Liabilities also are divided into two groups, sometimes given the same group names as the two chief division of assets, namely, current and fixed. The distinction here, however, is purely an arbitrary one, depending upon when the liability must be met. Current liabilities are those which should be paid within the current financing period, which is usually from sixty to one hundred and twenty days or perhaps one year. Those which do not mature for a longer period, or those which are readily renewable in character, are classed in the second group. For instance, a bond or a mortgage might fall due within thirty days after the date of a balance sheet, but if arrangements had been made for renewal, it would be tabulated among the fixed rather than among the current liabilities.

It is difficult to give any rule fully covering the difference between these two classifications of liabilities. Long-time notes and bonds are unquestionably fixed liabilities. On the other hand, the liabilities resulting from purchases on open accounts, short-time loans from banks or other sources, should be grouped as current. Judgment and common sense must play a part many times in making the right grouping, and it is a fundamental of accountancy that in case of doubt the preference must lie with the more conservative line of action. To list a liability as current is more conservative than to list it as fixed if there be a reasonable doubt as to its proper classification. Among the current liabilities are

found all short-time notes payable, open accounts resulting from purchases, accrued payables and similar items.

Net Worth.—The item of net worth presented on the balance sheet of a corporation is usually made up of two principal items, capital stock and surplus.

The capital stock may consist of two or more different kinds of stock issues such as first preferred stock, second preferred stock and common stock.

Surplus, too, may consist of a number of different items, of which the following are typical examples:

Surplus

Undivided profits

Appropriated surplus (or true reserves)

Capital surplus

Deficit (the result of a debit balance in a surplus account)

Deducting Intangible Assets from Surplus.—Many authorities advocate that certain intangible assets, such as goodwill, should be shown in the net worth section of the balance sheet as deductions from surplus. This treatment is particularly desirable from the viewpoint of one analyzing the balance sheet for credit purposes.

Balance Sheet Arrangement.—There are many different variations in the arrangement of balance sheets. Kilduff's Auditing and Accounting Handbook shows eight examples. The Accountants' Handbook ¹ exhibits five distinct types.

From the analyst's viewpoint the exact manner of balance sheet arrangement is unimportant as compared to the correctness of the groupings.

¹ Published by The Ronald Press Company.

CHAPTER III

THE APPROACH TO STATEMENT ANALYSIS

Defining "Analysis."—The word "analysis" as applied to the study of the balance sheet may be defined briefly as the examination of its component parts. Such an examination presents itself from a triple aspect :

1. Each part separately.
2. The parts in relation to each other.
3. The parts in relation to the whole.

Analysis of a balance sheet is prompted by a desire for information about a business which may not be evident through a mere cursory survey of the figures shown on the statement.

The Origin of Balance Sheet Analysis.—The origin of balance sheet analysis undoubtedly arose from the credit relation which exists between buyer and seller.

Before he would extend credit, the seller naturally desired to have some assurance that payment would be made when the account fell due and in consequence demanded a showing of the buyer's financial condition, i.e., a balance sheet. Upon securing the statement the seller studied it carefully to satisfy himself as to the probability of the buyer's ability to pay the account.

This scrutiny of such balance sheets finally gave rise to certain elementary methods of studying the figures, and these methods form the basis of present-day analysis procedure.

Not only has the technique of analysis become more definite, complete, and scientific, but there has also been a great broadening in the purposes of such analysis.

Classes of Balance Sheet Analysis.—Where, formerly, only a few credit men were interested in statement analysis, there now exist several broad classes of business men who use these methods.

The prospective investor who is contemplating investing his money in the stock or other securities of a company, is interested in the information shown in the balance sheet from a viewpoint different from that of the credit man; and yet he finds the technique of statement analysis invaluable to him in choosing investment offerings.

After investment has been made and the prospective investor becomes an actual holder of the securities, his interest in analysis of the statements of companies in which he is a stock or bondholder continues although his viewpoint is perhaps altered to some extent.

Reputable investment bankers have such a well-defined interest in statement analysis that often they maintain statistical or analytical departments to study the financial statements of the companies in which they are interested in order to avoid the possibility of marketing dubious issues.

The Business Executive.—The business executive is interested in statement analysis from a still different viewpoint.

Often he is so engrossed in the day-to-day details of running the business that he finds it necessary to fortify himself with a bird's-eye view of his business so that he will not lose his perspective of the business as a whole and as parts related to the whole and to each other.

Such a bird's-eye view he finds presented to him in the study and analysis of the financial statements of the business activities and conditions.

Where for some reason it is not practical for him to make this study and analysis himself, it is quite usual for him to have this work done for him by his company's comptroller or

auditor—another class of men who are interested in statement analysis.

The Public Accountant.—The public accountant is also vitally concerned with the various phases of the subject of statement analysis.

The time has long since passed when the public accountant was called upon to serve in the capacity of a mere thief catcher—a sort of mathematical detective.

At the present time his function in business goes far beyond the search for defalcations; he is called upon to be an expert advisor on some of the most important financial phases of business activities. The reports which he renders covering his auditing work are expected to cover financial interpretations and constructive criticisms, as well as the certification of the facts verified in the course of the audit.

The quality of the public accountant's work, which carries with it the satisfaction of his clients, depends much upon his ability to see beneath the obvious surface of financial statements and to draw shrewd conclusions as to business trends and conditions. Correct analytical technique is very vital to him.

The Methods of Analysis.—Having reviewed in a general way the characteristics of the balance sheet and the purposes and trend of analysis of financial statements, the next step is to consider the methods of statement analysis, to discuss their advantages and disadvantages, and to compare them as to purpose and usability.

This discussion of the analysis of balance sheets will be presented in four major divisions, which are as follows:

1. Analysis of the single balance sheet.
2. Analysis of two or more balance sheets.
3. Analysis by the ratio method.
4. Analysis by the trend method.

These four divisions are not sharply distinguished from one another, but overlap to some extent and shade into one another. However, in a general way they follow the sequence of the historical development of analysis technique, which is a very satisfactory and valuable method of approaching the study of this particular subject.

CHAPTER IV

ANALYSIS OF A SINGLE BALANCE SHEET

History of Balance Sheet Analysis.—In the last chapter it was stated that balance sheet analysis undoubtedly originated from the desire of the seller to be assured that he would receive payment from the buyer to whom he sold on credit, and that in order to have evidence upon which to base his judgment, he often insisted that the buyer furnish a copy of his balance sheet or statement of financial condition.

This led to the development of methods of analyzing one balance sheet alone, usually the latest balance sheet of the buyer; and sometimes when the latest balance sheet had been drawn off a considerable time previous, the seller even insisted on a new balance sheet being made up that would show the buyer's latest financial condition.

Old balance sheets were considered of little importance, as the seller was principally concerned with the buyer's condition at a time close to the date on which the seller was about to extend credit.

Today balance sheets of prior dates are looked to for much information of value, but there is still, of course, vital information to be obtained from the latest balance sheet standing alone.

For this reason it is important to consider what should be studied in the examination of a single balance sheet.

Illustrative Figures.—The reader will find it easier to follow and understand the steps in such an examination if figures are used, so that he can see the procedure developed from an illustrative case, including the description of the balance sheet items as well as the figures. So the procedure will be discussed

from the background of the following assumed balance sheet of the Ames Manufacturing Company.

THE AMES MANUFACTURING COMPANY

BALANCE SHEET

As of December 31, 1924

Assets

CURRENT ASSETS:

Quick Assets:

Cash.....	\$10,512	
Accounts Receivable.....	5,857	\$16,369

Working Assets:

Inventory.....	22,210	
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Total Current Assets.....	\$38,579	
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FIXED ASSETS.....	37,290	
-------------------	--------	--

PREPAID EXPENSE.....	2,459	
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Total Assets.....	\$78,328	
-------------------	----------	--

Liabilities and Capital

CURRENT LIABILITIES:

Notes Payable—Trade.....	\$ 1,000	
--------------------------	----------	--

Notes Payable—Bank.....	2,000	
-------------------------	-------	--

Accounts Payable.....	5,000	
-----------------------	-------	--

Dividends Payable.....	2,000	
------------------------	-------	--

Accruals Payable.....	248	
-----------------------	-----	--

Total Current Liabilities.....	\$10,248	
--------------------------------	----------	--

LONG-TIME LIABILITIES.....	none	
----------------------------	------	--

Total Liabilities.....	\$10,248	
------------------------	----------	--

Net Worth.....	\$68,080	
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Represented by:

Capital Stock.....	\$50,000	
--------------------	----------	--

Surplus.....	18,080	\$68,080
--------------	--------	----------

Solvency of the Business.—Probably the first question that would occur to any business man interested in the financial condition of the Ames Manufacturing Company would be: Is the Ames Manufacturing Company solvent?

An examination of the balance sheet figures shows that the company is solvent on December 31, 1924. Its total assets are \$78,328 and its total liabilities are \$10,248. Deducting the

latter from the former leaves a balance of \$68,080, which represents the net worth—the owners' equity in the business, of which \$50,000 is a permanent investment in the nature of capital stock outstanding, and \$18,080 is surplus left in the business, probably surplus earnings, and subject to withdrawal in the form of dividends.

Permanency of Surplus.—In many cases the surplus may be looked upon as practically a permanent investment. Many corporations have adopted the conservative policy of continuously adding to surplus rather than diminishing it. To put it in another way, only a part of each year's net profit is withdrawn, and the balance is left for permanent use in the business operations, thus leaving a margin to provide for the natural growth and increase in the volume of business and at the same time stabilizing this investment value by additional earned surplus.

Nevertheless, the analyst must never lose sight of the fact that all of the surplus may be withdrawn as dividends and that such a possibility should always receive consideration when he is studying the balance sheet figures.

Ability to Pay Debts.—However, the mere fact of solvency indicated by the figures is only a first step in the chain, and is not even conclusive as to probable continuance of the business, for it sometimes happens that a solvent corporation is forced into bankruptcy.

A corporation may have a substantial excess of asset values over liabilities, which represents a solvent condition, and still if it has an insufficient amount of those asset values in current form, it may soon be in a condition where liabilities cannot be met when they fall due. In aggravated instances such a condition exposes the corporation to the danger of drastic action by creditors and may result in the taking over of the business by a receiver.

Current Assets and Current Liabilities.—Therefore, the next step in the analysis is to study the balance sheet figures to determine whether such a condition exists. To do this the current assets are compared with the current liabilities, thus:

Current Assets	\$38,579
Current Liabilities	<u>10,248</u>
Net Current Assets	<u>\$28,331</u>

The “2 to 1” Rule.—In analytical procedure credit men for many years have figured that if the current assets amounted to more than twice as much as current liabilities, such a condition could be considered as satisfactory. This relationship between the two groups of current items, current assets and liabilities, has been called the “current ratio,” and when the condition of current assets being more than twice as great as liabilities has existed, it has been referred to as a “2 to 1 current ratio.”

The current ratio may be expressed as a percentage, obtained by dividing the current assets by the current liabilities, thus:

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{\$38,579}{\$10,248} = 376\% = \text{Current Ratio.}$$

If the “2 to 1” rule is accepted, then a current ratio of 200% would be satisfactory; and certainly the ratio shown on the balance sheet of the Ames Manufacturing Company of 376% would be considered as representing a very satisfactory situation, but not always.

Quick and Working Assets.—There is still another pitfall to be guarded against. If a large part of the current assets consists of merchandise inventory which is difficult to sell, the analyst must not be misled by the 376% current ratio into believing that the situation presents an entirely sound condition.

The 376% current ratio indicates that there is \$3.76 worth of current assets to meet every \$1 of liabilities. But if, for

example, it were found that only a small part of the current assets was in the form of cash and receivables and a larger part was merchandise, the ratio would not seem as favorable.

The Acid Test.—Therefore, the next step consists of an examination of this feature of the balance sheet, which is accomplished by comparing the current liabilities with the quick assets. This ratio has sometimes been referred to as the “acid test.”

$$\frac{\text{Quick Assets}}{\text{Current Liabilities}} = \frac{\$16,369}{\$10,248} = 160\% = \text{Acid Test Ratio.}$$

This ratio tells that the Ames Manufacturing Company has \$1.60 of quick assets for every dollar of current liabilities; and since it is somewhat of an accepted rule among credit men that \$1 of quick assets per \$1 of current liabilities indicates a safe condition, the balance sheet of the Ames Manufacturing Company may be said to present a very satisfactory condition from the standpoint of this acid test.

For many years the use of the “current ratio” and the “acid test” comprised practically the whole art of balance sheet analysis.

Scaling the Assets.—The next step in the development of analysis procedure undoubtedly grew out of the inaccuracies and uncertainties which resulted from old-fashioned and unscientific bookkeeping. So many of the balance sheets were prepared from poorly kept records that the analyst felt that it was necessary for him to discount many of the statements which were presented for his consideration. From this resulted a procedure consisting of discounting—marking down—or “shading” the asset values.

When using this method of analyzing the balance sheet, the analyst would construct a new balance sheet from the old one. In building up the new one he would carry over to it all the liabilities shown on the old one, but would make heavy

reductions in most of the asset values. The motive for this drastic revision never appears to have been very sharply defined but apparently it was an attempt to reach the goal of the liquidating value of the assets at a forced cash sale.

Schedule for Marking Down.—One author says that asset values should be shaded somewhat as follows:

Kind of Asset	Per Cent
Merchandise:	
General Store.....	20-30
Groceries.....	10-20
Dry Goods.....	20-25
Hardware.....	25-30
Millinery.....	35-60
Clothing.....	25-35
Accounts Receivable.....	1-10
Plant, Machinery and Tools.....	50
Furniture and Fixtures.....	50
Intangible Assets.....	100

Apparently it is intended that these reductions are to be made indiscriminately without regard for the character of the management, the geographical location of the business, or other factors.

Just how the analyst would decide whether to deduct 35% or 60% from the inventory value of hats in any given instance still remains a mystery.

Proper Balance Sheet Values.—Of course, this whole procedure is the height of absurdity under present-day conditions. It is senseless because it is arbitrary.

Even though it did result in reducing the assets to a fairly accurate cash value, which is improbable, it is still useless because it assumes something which is untrue. It assumes that the company under analysis is about to liquidate and go out of business.

The modern theory holds that asset values must be judged from the viewpoint of a going business. The only possible

basis for accurately valuing assets is their cost and this is now universally recognized both by business men and by the courts.

It is true that good accounting practice requires, in the case of inventories, that they should be valued at cost price or market price whichever is lower, but when this adjustment is necessary it is taken care of by an expedient known as a "valuation account," or more commonly, a "reserve account," whereby the original cost prices are not altered or lost.

Nor does the rule imply that depreciation of any asset shall be ignored. The original cost is merely the basis of valuations, as distinguished from appraisal or forced liquidation values. Deductions for depreciation find their place in the accounting system in valuation or reserve accounts.

In most published balance sheets asset values are shown net, i.e., at one figure representing the original cost less the accumulated depreciation.

Illustration of Markdown Method.—In no theory of asset valuations is there justification for arbitrary percentage reductions in asset values by the analyst. It is a "rule of thumb" procedure, based on false assumption, inaccurate and unjust.

Applying the percentages suggested to typical balance sheets gives some absurd results.

Filene's (Wm.) Sons Company, is a famous store engaged exclusively in the sale of ready-to-wear apparel. Its balance sheet as given in Moody's Manual is as follows:

<i>Assets 1923</i>	
Real Estate.....	\$ 955,189
Goodwill, Patents, etc.....	1,000,000
Investments.....	1,878,220
Fixtures and Equipment.....	24,326
Merchandise (<i>i</i>).....	2,658,186
Cash (<i>q</i>).....	379,611
Accounts Receivable (<i>q</i>).....	916,035
Prepaid Items.....	93,197
Deferred Items.....	729,810
Total.....	<u>\$8,634,574</u>

Liabilities

Capital Stock	\$4,497,300
Accounts Payable (<i>c</i>)	650,414
Accrued Items (<i>c</i>)	150,182
Reserve for Taxes (<i>c</i>)	815,410
Other Reserves	946,412
Surplus	<u>1,574,856</u>
Total	<u>\$8,634,574</u>

The quick assets (marked *q* above) total \$1,295,646. The inventories (marked *i*) amount to \$2,658,186. The current liabilities (marked *c*) equal \$1,616,006.

The "acid test" shows \$.80 for each dollar of liabilities while the "current ratio" shows \$2.45 for each dollar of liabilities. This is a good showing.

Using the percentages previously suggested, the balance sheet may next be revised downward:

Assets 1923

Real Estate (50% off) (1)	\$ 477,594
Goodwill, Patents, etc. (100%)	—
Investments (2)	1,878,220
Fixtures and Equipment (50% off)	12,163
Merchandise (35% off)	<u>1,727,821</u>
Cash	379,611
Accounts Receivable (2)	916,035
Prepaid Items (2)	93,197
Deferred Items (100%) (3)	—
Total	<u>\$5,484,641</u>

Liabilities

Capital Stock	\$4,497,300
Accounts Payable	650,414
Accrued Items	150,182
Reserve for Taxes	815,410
Other Reserves	<u>946,412</u>
Total	<u>\$7,059,718</u>
Deficit (deduct to balance)	<u>1,575,077</u>
Total	<u>\$5,484,641</u>

The item marked (1) probably consists in part of land. Any error involved in marking down that portion is probably

compensated by leaving the other items marked (2) at full value.

While the item marked (3) was not specifically mentioned as subject to discount, it seems consistent to mark it down 100%, since it is probably without cash value upon liquidation.

Effect of the Analysis.—What has been the effect of this “analysis” upon a well-known, prosperous, splendidly managed company?

The surplus of \$1,574,856 has been changed into a deficit of \$1,575,077—a total decrease in net worth of \$3,149,933. The acid test shows the same as before, but the current ratio now indicates only \$1.87 of current assets for each dollar of current liabilities.

From a splendid credit position, this drastic procedure indicates a company to whom credit might be offered hesitatingly.

Applying this unjust method to a less well-rated organization might easily develop figures indicating actual insolvency.

The Annual Sales.—Turning attention again to the figures for the Ames Manufacturing Company, there is very little further information that can be gained without knowing additional facts. The most important fact desired is the amount of the annual sales for the year.

It may well be noted here that information as to the amount of annual sales is now regarded as vital to intelligent balance sheet analysis. In spite of the fact that such figures belong in the profit and loss statement instead of the balance sheet, the custom is growing of including figures reflecting sales volume as supplementary information to balance sheets even when other profit and loss elements are not furnished.

The sales for the year 1923 amounted to \$96,691. What help does this give in analyzing the balance sheet? It throws some additional light on two important items—accounts receivable and inventory.

Sales and Receivables.—Since accounts receivable result from sales, there is a natural relationship between them which can be reflected by a ratio.

If all goods were sold on 30 days' credit and all collections were made promptly, the balance of accounts receivable at any one time should be $1/12$ of the sales volume for the year. This assumes that the annual sales are made in 12 equal monthly amounts. This assumption is never absolutely true and in many lines of business never even approximately true.

Nevertheless it is a roughly accurate guide to consider that the ideal relationship between accounts receivable and sales is 1 to 12, where the usual credit terms are 30 days, and 1 to 6 where the usual credit terms are 60 days.

The Ratio of Receivables to Sales.—To determine this relationship for the Ames Manufacturing Company, divide the sales by the accounts receivable:

$$\frac{\text{Sales}}{\text{Accounts Receivable}} = \frac{\$96,691}{\$5,857} = 1650\%.$$

This indicates \$16.50 of sales for each \$1 of accounts receivable. This is better than the "ideal" of \$12 of sales to \$1 of receivables just discussed.

It means that the usual terms are shorter than 30 days, or else that attractive cash discounts have induced a large proportion of customers to pay before due date.

As a matter of fact the selling policy of Ames Manufacturing Company is conducted to some extent on a C.O.D. basis. Only a part of their sales are on credit. If it were known what part of the total sales were made on credit, that part could be divided by the receivables. This would furnish information about the collection efficiency of this company.

As it is, the analyst must rest content with the knowledge that as far as can be seen the condition of the accounts receivable as shown by the ratio appears good.

Sales and Inventory.—The second use of the sales figure is in connection with the inventory.

There is an obvious relationship between the amount of merchandise on hand and the amount sold.

If the annual sales were reduced to cost and if the inventory was an average inventory, the one divided by the other would give the “merchandise turnover,” which is a significant percentage showing selling efficiency, much used by merchants.

The Merchandise Turnover.—The principle of the merchandise turnover is based on the fact that the most profit can be made by that merchant, within a given group, who can get the greatest volume of sales with a given average investment in merchandise.

And, of course, the reverse is true. That merchant with the smallest sales in relation to average inventory is making the least profit. Usually he may be suspected of merchandising inefficiency and his inventory also may be under the suspicion of containing a large proportion of obsolete or unsalable stock.

If it were possible for the analyst to ascertain (1) the average inventory and (2) the annual sales at cost price, he could divide the first into the second and obtain a valuable insight into the character of the inventory item on the balance sheet.

A Substitute for the Turnover.—Usually he cannot learn the average inventory but only the actual inventory at the close of the fiscal period, and usually he cannot determine the cost value of the annual sales but is fortunate to learn the annual sales at selling price.

He can use these figures as the basis for a “turnover.” It will be less accurate but still fairly significant.

For the Ames Manufacturing Company the calculation is as follows:

$$\frac{\text{Annual Sales} = \$96,691}{\text{Inventory} = \$22,210} = 435\%.$$

This indicates roughly that the inventory is "turned" approximately four times per year, i.e., that three months' supply of merchandise is on hand.

Without having any standards of comparison, this is difficult to interpret. It "looks" all right and that is about as much as can be said at this stage in the development of analysis methods.

Danger Signals on the Balance Sheet.—There are certain general danger signals that will be looked for by the experienced analyst. These danger signals are:

1. Very small amount of cash.
2. Improper combinations of unlike balance sheet items.
3. Heavy notes receivable.
4. Large intangible assets (particularly when there is no surplus).

Cash is one asset that cannot be "innocently" misrepresented. When a weak concern desires to make a good financial showing as a basis for credit, it can find excuses for many infractions of good accounting practice, but the item of cash cannot be "improved" without positive misrepresentation. Experience has shown that a trifling cash balance on a balance sheet is quite often a reliable warning signal.

Improper combinations of items may well throw doubt on the entire balance sheet. Examples of such improper combinations taken from actual balance sheets are:

Cash and Accounts Receivable	\$.....
Plant and Franchise
Government and Other Bonds

In a very few lines of business it is customary to accept notes in payment of accounts receivable. Usually, however, there is a strong presumption that the credit management is poor when a substantial item of notes receivable appears on a balance sheet.

The combination in one balance sheet of no surplus together with heavy intangible assets usually leads the analyst to suspect that these intangible assets really represent a deficit, either in whole or in part.

None of these four danger signals are positive indicators, but they are serious warnings that the experienced analyst has learned to regard with real respect.

Importance of Current Ratio and Acid Test.—Perhaps the most important features discussed in this chapter are the current ratio and the acid test.

There has been a tendency on the part of modern writers to slight these balance sheet tests.

It is true, of course, that the rule of "two dollars of current assets for every dollar of current liabilities" is arbitrary. Conditions vary in different lines of business and a proper ratio for one business might not be proper for another, and yet, as a practical credit test applicable to a wide variety of statements, it can hardly be abandoned.

Window Dressing.—It is also true that these two ratios are subject to "window dressing." This is a term used to describe financial operations which have for their only purpose the preparation of a more attractive balance sheet.

A company might normally show the following condition at the end of a year:

Cash.....	\$ 2,000
Accounts Receivable.....	5,000
Merchandise.....	<u>4,000</u>
Total.....	<u>\$11,000</u>
Current Liabilities.....	\$ 6,000

This shows only \$1.83 of current assets for every dollar of current liabilities. Desiring to show a "2 to 1" ratio on the balance sheet a "sale" might be made of \$1,000 of merchandise for \$2,000 to some friendly interest.

This would result in the following figures :

Cash.....	\$ 2,000
Accounts Receivable.....	7,000
Merchandise.....	<u>3,000</u>
Total.....	<u>\$12,000</u>
Current Liabilities.....	\$ 6,000

The ratio is now \$2 of current assets for every dollar of current liabilities. The day after the date of the statement the "sale" could be reversed in accordance with the previous friendly understanding.

There are other methods of "window dressing" which need not be discussed.

Interpreting the Ratio.—The balance sheet analyst realizes the possibility of "window dressing," and he does not regard a good ratio as a guarantee of good condition. But he does look with suspicion on a poor ratio.

He realizes that a favorable ratio may mean nothing but that an unfavorable ratio is significant. He is in the same position as the doctor who does not regard the lack of fever as indicative of perfect health but who regards its presence as an important warning.

Other methods used to test financial statements have this important characteristic.

The current ratio and the acid test are both based on sound common sense from the viewpoint of the commercial credit grantor.

S. F. Brewster, in "Analyzing Credit Risks," expresses this thought forcefully:

A situation is frequently encountered . . . where the total assets are considerably in excess of the total liabilities but where the quick liabilities are in excess of the quick assets. To extend credit to a concern in such a condition is almost equivalent to buying a lawsuit.

CHAPTER V

COMPARATIVE BALANCE SHEETS

Use of Comparative Figures.—In the last chapter it was shown that a limited amount of information could be gained from the study of one balance sheet.

But the major difficulty in such a study is the lack of comparative data.

All measurement is based upon comparison. Measuring the distance between two points involves comparing that distance with some other distance. The statement that it is 245 miles from St. Louis to Kansas City simply means that the distance between the two points has been compared with another distance known as a "mile" and is 245 times as long.

Similarly with the measurement of weight. A man's weight is obtained by comparing it with another weight known as the "pound."

Instances could be multiplied indefinitely to show that all measurement is based upon comparison.

Methods of Comparison.—Usually measurement is based upon present comparison with a standard.

The mile, the pound, the quart and other familiar units are standards which have been adopted for convenience.

There is also historical comparison which is frequently made without reference to standards—the comparison of the same things at different times.

Thus, one may say, "I drove my car twice as far today as yesterday," or, "My weight is 10% greater than it was a year ago."

Historical comparison compares the same thing at two different times instead of two different things at the same time.

Applied to balance sheet analysis, historical comparison refers to the comparison of balance sheets of the same company as of two or more different dates.

Trends Shown by Historical Comparison.—Such comparison gives relative results showing trends.

Trends are all important in the analysis of financial statements. They answer the vital question as to whether the condition of the company is improving or not.

Someone has said, "It is not where you are, but which way you are going that counts." This statement is as true of corporations as it is of individuals, and while a company may be below standard in some respect, if its condition is consistently improving, optimism is justified.

Statements of Ames Manufacturing Company.—Returning to the illustration of the Ames Manufacturing Company, the following comparative figures are valuable.

THE AMES MANUFACTURING COMPANY
COMPARATIVE BALANCE SHEET
As of December 31

<i>Assets</i>	1923	1924
Cash.....	\$ 7,190	\$10,512
Accounts Receivable.....	5,629	5,857
Quick Assets.....	\$12,819	\$16,369
Inventories.....	28,077	22,210
Current Assets.....	\$40,896	\$38,579
Fixed Assets.....	36,163	37,290
Prepaid Expense.....	2,545	2,459
Total Assets.....	<u>\$79,604</u>	<u>\$78,328</u>
<i>Liabilities and Net Worth</i>		
Notes Payable—Trade.....	\$ 3,000	\$ 1,000
Notes Payable—Bank.....	3,000	2,000
Accounts Payable.....	8,000	5,000
Dividends Payable.....	2,000	2,000
Accrued Liabilities.....	337	248
Current (and Total) Liabilities.....	<u>\$16,337</u>	<u>\$10,248</u>

Capital Stock Outstanding.....	\$50,000	\$50,000
Surplus.....	13,267	18,080
Total Net Worth.....	<u>\$63,267</u>	<u>\$68,080</u>
Total Liabilities and Net Worth.....	<u>\$79,604</u>	<u>\$78,328</u>
Sales.....	<u>\$90,652</u>	<u>\$96,691</u>

Determining the Ratios.—In the last chapter certain ratios were suggested. If they are calculated for both balance sheets, their comparison should be illuminating.

	1923	1924
Quick Assets.....	\$12,819	\$16,369
Current Liabilities.....	\$16,337	\$10,248
Ratio (acid test).....	78%	160%

This is very interesting. For every \$1 of current liabilities there was only \$.78 of quick assets in 1923 as compared with \$1.60 of quick assets in 1924. This trend is obviously favorable.

	1923	1924
Current Assets.....	\$40,896	\$38,579
Current Liabilities.....	\$16,337	\$10,248
Current Ratio.....	250%	376%

This trend is also good. From \$2.50 of current assets in 1923 to \$3.76 of current assets in 1924 for every dollar of current liabilities is a favorable change.

In each instance alone the showing is better than required by the "2 to 1" rule. The comparison shows the trend and if the figures were reversed, i.e., if the 1923 ratio was 376% and the 1924 ratio was 250%, the reader would be warned of an unfavorable tendency, whereas, with either of the balance sheets alone, he might easily be satisfied with the current ratio.

	1923	1924
Sales.....	\$90,652	\$96,691
Accounts Receivable.....	\$ 5,629	\$ 5,857
Ratio.....	1,610%	1,650%

The trend of these ratios is favorable. An increase is

shown from \$16.10 to \$16.50 of annual sales for each dollar of accounts receivable.

	1923	1924
Sales.....	\$90,652	\$96,691
Inventory.....	\$28,077	\$22,210
Ratio.....	323%	435%

This comparison is favorable. When, for every dollar of inventory the sales are increased from \$3.23 to \$4.35 a trend is shown toward more profitable merchandising methods lulling possible suspicions that the inventory may be getting overloaded with obsolete or unsalable stock.

While it may be assumed that the reason lies in more efficient merchandising, there are other possible causes that should not be overlooked:

1. The 1924 inventory may be lower than the average for the year.
2. The 1923 inventory may be higher than the average for the year.
3. The inventories may consist of proportionally the same number of physical units but the 1924 inventory may have been acquired at a substantially lower cost.
4. The sales may consist of proportionally the same number of physical units but the 1924 sales prices per unit may be greater.

These are possibilities that exist where sales (at selling price) are divided by actual inventory instead of following the correct, but often impracticable method of dividing average inventory into sales at cost.

The comparison of these four ratios naturally represents the first step in analysis when two or more balance sheets are available. However, the availability of two or more balance sheets offers an opportunity for a different type of analysis.

Comparison of Amounts.—With two statements available the figures may be lined up side by side and the increase or

decrease of each item and group ascertained. This is an important basic method of analysis for showing changes.

THE AMES MANUFACTURING COMPANY
COMPARATIVE BALANCE SHEET
As of December 31

<i>Assets</i>	1923	1924	Increase	Decrease
Cash.....	\$ 7,190	\$10,512	\$3,322	—
Accounts Receivable.....	5,629	5,857	228	—
Inventories.....	28,077	22,210	—	\$5,867
Fixed Assets.....	36,163	37,290	1,127	—
Prepaid Expense.....	2,545	2,459	—	86
Total Assets.....	<u>\$79,604</u>	<u>\$78,328</u>	<u>\$4,677</u>	<u>\$5,953</u>
<i>Liabilities and Net Worth</i>				
Notes Payable—Trade.....	\$ 3,000	\$ 1,000	—	\$2,000
Notes Payable—Bank.....	3,000	2,000	—	1,000
Accounts Payable.....	8,000	5,000	—	3,000
Dividends Payable.....	2,000	2,000	—	—
Accrued Liabilities.....	337	248	—	89
Capital Stock Outstanding.....	50,000	50,000	—	—
Surplus.....	<u>13,267</u>	<u>18,080</u>	<u>\$4,813</u>	<u>—</u>
Total Liabilities and Net Worth	<u>\$79,604</u>	<u>\$78,328</u>	<u>\$4,813</u>	<u>\$6,089</u>

Presenting the statement in this form emphasizes the changes that have taken place. The facts stand out clearly and their relative importance is more easily gauged.

This method of analyzing is perhaps the one most commonly used. For clearness the above statement does not show group headings and sub-totals that would usually be given.

Application of Funds.—As a step further, it is sometimes of interest to use the figures of increase and decrease in another statement. This statement is based on the fact that:

INCREASES IN ASSETS
plus
DECREASES IN LIABILITIES AND NET WORTH
equals
DECREASES IN ASSETS
plus
INCREASES IN LIABILITIES AND NET WORTH

Applying to this formula the figures of the Ames Manufacturing Company, the following proof is obtained:

Increases in Assets	\$ 4,677	\$ 5,953	Decreases in Assets
Decreases in Liabilities and Net Worth	6,089	4,813	Increases in Liabilities and Net Worth
Total	<u>\$10,766</u>	<u>\$10,766</u>	Total

The equation forms the basis for the following statement, usually called the "Application of Funds Statement," which shows (1) the classified sources from which funds were received and (2) what was done with the funds.

THE AMES MANUFACTURING COMPANY

APPLICATION OF FUNDS STATEMENT

For the Year Ended December 31, 1924

SOURCE OF FUNDS:

Increase in Surplus.....	\$ 4,813
Decrease in Inventories (1).....	5,867
Decrease in Prepaid Expenses (2).....	86
Total to Be Accounted for.....	<u>\$10,766</u>

APPLIED TO THE FOLLOWING PURPOSES:

Increase in Cash.....	\$3,322
Increase in Accounts Receivable.....	228
Increase in Fixed Assets.....	1,127
Decrease in Notes Payable—Trade.....	2,000
Decrease in Notes Payable—Bank.....	1,000
Decrease in Accounts Payable.....	3,000
Decrease in Accrued Liabilities.....	89
	<u>\$10,766</u>

Decreases in assets are theoretically regarded as sources of actual funds for the purpose of the above type of statement.

This viewpoint may be regarded as true in the case of marked (1) inventories. In the case of such an item as marked (2) prepaid expense, it is only theoretically, not actually true. No actual cash was realized in this connection, but had not this decrease in prepaid expense occurred, the increase in surplus would have been greater to the extent of \$86, so that it amounts to the same thing.

Also decreases are often noted in fixed asset accounts which are not due to some of those assets having been converted into

cash but rather to increases in the allowance for depreciation—purely a book entry with no effect on the cash.

Nevertheless, this type of statement assumes that a decrease in fixed assets is a source of funds, because the increase in surplus would have been larger by the same amount had not such depreciation provision been made.

In spite of the false assumptions as to actual funds resulting from all decreases in asset values, the effect produced by the statement is the same as though the false assumptions were really true.

This type of statement is most frequently used by accountants to answer the business man's question: "You say my business shows a profit for the year. What has become of it?"

It is also used often enough by the analyst of financial statements to justify its inclusion here as an optional part of analysis technique.

Percentage Analysis of Statements.—For the sake of completeness it should be mentioned that there is some authority for a plan which shows on the face of a comparative balance sheet the percentage that each item and group of items bears to the total assets.

Applying this plan to the figures for the Ames Manufacturing Company, the statement would appear as follows:

THE AMES MANUFACTURING COMPANY
COMPARATIVE BALANCE SHEET
As of December 31

<i>Assets</i>	1923	%	1924	%	In- crease	De- crease
Cash.....	\$ 7,190	9.0	\$10,512	13.4	\$3,322	—
Accounts Receivable...	5,629	7.1	5,857	7.5	228	—
Quick Assets.....	\$12,819	16.1	\$16,369	20.9	3,550	—
Inventories.....	28,077	35.3	22,210	28.4	—	\$5,867
Current Assets.....	\$40,896	51.4	\$38,579	49.3	—	2,317
Fixed Assets.....	36,163	45.4	37,290	47.6	1,127	—
Prepaid Expense.....	2,545	3.2	2,459	3.1	—	86
Total Assets.....	<u>\$79,604</u>	<u>100.0</u>	<u>\$78,328</u>	<u>100.0</u>	—	1,276

Liabilities and Net Worth

Notes Payable—Trade..	\$ 3,000	3.8	\$ 1,000	1.3	—	\$2,000
Notes Payable—Bank..	3,000	3.8	2,000	2.6	—	1,000
Accounts Payable.....	8,000	10.0	5,000	6.4	—	3,000
Dividends Payable.....	2,000	2.5	2,000	2.6	—	—
Accrued Liabilities.....	337	0.4	248	0.3	—	89
Current Liabilities...	<u>\$16,337</u>	<u>20.5</u>	<u>\$10,248</u>	<u>13.2</u>	—	6,089
Capital Stock Outstand-						
ing.....	\$50,000	62.8	\$50,000	63.8	—	—
Surplus.....	<u>13,267</u>	<u>16.7</u>	<u>18,080</u>	<u>23.0</u>	\$4,813	—
Net Worth.....	<u>\$63,267</u>	<u>79.5</u>	<u>\$68,080</u>	<u>86.8</u>	4,813	—
Total Liabilities and Net						
Worth.....	<u>\$79,604</u>	<u>100.0</u>	<u>\$78,328</u>	<u>100.0</u>	—	1,276

Interpreting the Statement.—It appears that very little value attaches to these percentage calculations. In fact, to the untrained reader they might at times be actually deceptive as in the following example, occurring in a balance sheet used to illustrate this method in a pamphlet, "The Preparation and Use of Financial Statements," published by the Illinois Manufacturers Cost Association:

	Last Year	%	This Year	%
Surplus.....	\$ 3,938,000	15.2	\$ 4,650,000	15.1
Total Assets.....	25,854,000	100.0	30,634,000	100.0

A superficial survey might give the impression of a poorer surplus condition because of the drop in the percentages from 15.2% to 15.1%. It may appear a trifle far fetched that any person could be so easily deceived, yet the example given illustrates the point that the total of the assets does not furnish a desirable base figure for determining percentages.

The fluctuations of the total assets may be out of all harmony with certain items or groups, and no useful purpose is served by figuring the percentages, one of the other.

Use of "Increase and Decrease" Method.—The important feature of this chapter is the "increase and decrease" method of analyzing a comparative balance sheet.

The use of this method plus the calculation of the current ratio (and sometimes the "acid test" ratio) represents about the sum total of analysis technique in common use at the present time.

And for the ordinary work of credit departments, it is usually sufficient. But for the needs of investors, executives, public accountants and to meet extraordinary credit situations, this limited procedure is quite inadequate.

The next few chapters will be devoted to the more advanced technique of balance sheet analysis and a comparative consideration of different methods.

CHAPTER VI

SPECIFIC BUSINESS AILMENTS

Purpose of Analysis.—This chapter represents an important interlude in the development of analytical technique.

Before developing finer and surer methods of analysis, it is first necessary to consider more definitely the purpose of the analysis.

The physician, in making his diagnosis, follows a systematic procedure, each step of which has a specific purpose.

His is no unorganized survey based on the hope of luckily discovering important facts. His entire plan of diagnosis is based on positive knowledge that there are certain common human ailments. He makes an orderly examination for symptoms of each, thus narrowing his field of investigation systematically.

Diagnosing Business Ailments.—Similarly the balance sheet analyst should search for common business ailments. He should know what those ailments are, the symptoms of each, and their relative seriousness.

This knowledge, like the physician's, must be based on experience, i.e., the history of the thousands of cases of business "disease" as embodied in the statistics of failure.

The physician who desires to investigate the causes of good health does not study well people, but diseased ones. The business analyst who desires to learn the causes of business success studies business failures.

Commercial Failure Statistics.—The great mercantile agencies, Bradstreet's and R. G. Dun's, have been accumulating failure statistics for years. These statistics classify business failures by causes.

Without attempting to reproduce the statistics which vary slightly from year to year, it is sufficient to follow the general statement as contained in the Accountant's Handbook:¹

Two chief classes of business failures are:

1. Those for which the management is responsible.
2. Outside circumstances for which the management is not responsible.

Under the first class are those resulting from:

- a. Incompetence.
- b. Lack of capital.
- c. Poor credit management, etc.

About 80% of failures are accounted for by this group.

Under the second class are those resulting from:

- a. Competition.
- b. Physical disasters.
- c. General business conditions.

About 20% of failures result from these causes.

The estimate that 80% of failures are directly chargeable to poor management is probably low rather than high, because certain of the companies whose failures are ascribed to "competition" and "general business conditions" probably would have overcome the difficulties had their management been competent.

Relation of the Four Credit Factors.—These statistics clearly emphasize the overwhelming importance of the factor of business ability.

It was previously stated that there were four primary factors to use in judging the desirability of a credit risk (and these four are also important from the viewpoint of other analysts than credit men).

These four factors were stated to be:

1. Character—honesty, habits, etc.
2. Capacity—business ability and astuteness.

¹ Published by The Ronald Press Company.

3. Capital—financial condition and earnings.
4. Conditions—the general business situation.

From the statistics given it is evident that (2) capacity, and (3) capital, are at least four times (80% as compared with 20%) as important as the other two.

Financial Condition Reflects Ability.—If, as many think, lack of good financial condition and earnings is an evidence of lack of business capacity, then there are only three factors—character, capacity, and conditions.

In support of this point a quotation from *Forbes Magazine* is interesting. When Harvey Firestone, the well known tire manufacturer, was asked what brought success, he said “lack of capital” which made him “watch every expenditure.”

“If I had had all the money I needed to start my business, it would never have grown so large as it is, because I would not have had to study every detail.”

Assuming this to be true, and assuming that lack of capacity (or ability) accounts for more than 80% of business failures, then the analyst of financial statements will be primarily interested in studying the elements of business ability and the symptoms which evidence lack of ability.

Five Common Business Ailments.—Research into many hundreds of insolvent companies indicates that there are five common business ailments which are usually the result of managerial inefficiency to some degree.

One or more of the five are found to exist in the case of practically every honest failure (the deliberately dishonest failures and those due to public calamities are not considered in this volume).

These five common business ailments are:

1. Insufficient net profits.
2. Over-investment in inventory.
3. Over-investment in receivables.

4. Over-investment in fixed assets.
5. Insufficient capitalization.

Statements Reflect Business Ailments.—For (1) insufficient net profit, including all the various contributory factors such as insufficient sales, etc., the analyst studies the profit and loss statement and for the remaining four he studies the balance sheet.

At first thought it may appear rather far-fetched to use financial statements as a means of investigating so intangible a quality as business ability but the fact remains that these statements are, in effect, mirrors which reflect business ability more accurately than any other means.

Since the analysis of profit and loss statements is treated later in this volume, the reader need not concern himself now with the first common business ailment—insufficient net profit—but proceed directly to a consideration of the remaining four.

The second of the five ailments is over-investment in inventory. This simply means that a disproportionate amount of money is tied up in inventory.

This has nothing to do with the actual amount of money in inventory, but rather the size of the inventory compared to other financial elements. A million dollar inventory might be too small for one corporation, whereas a \$10,000 inventory might be too large for another.

Much depends upon the kind of business. For example, the agricultural implement business during certain times of the year requires a very high inventory. This holds true in connection with manufacturers of skates, stoves, automobile heaters, blankets, electric fans, companies handling natural ice, and other seasonal enterprises.

Other types of business, because of their very nature, require very low inventories. The packing house, because it largely handles fresh meats, maintains a low inventory. This

is also true with grocery stores, artificial ice manufacturers, dairies, etc.

But although enterprises differ considerably with respect to the normal size of their inventories, it is true that for any particular line of business there is some point beyond which the inventory cannot increase without danger.

Over-investment in inventory is a serious condition. In the first place, it ties up money in such a way that it does not even earn bank interest; and in the second place, it requires storage space, and the cost of providing such space is often heavy. Furthermore, excess inventory may depreciate or become obsolete before use.

Many corporations have become insolvent due to an aggravated inventory condition.

The Holberg Manufacturing Company of Chicago made standard machinery. In 1920 they felt the need of additional capital. Because this was a small company the securing of additional capital was quite a task.

The banks refused to handle the proposition; brokerage houses were unwilling to take on the sale of stock; bond houses refused to consider lending assistance.

An investigation by a public accountant revealed the astonishing fact that the Holberg Manufacturing Company had tied up in excess inventory more than twice the amount of money they were so anxiously seeking from outside channels. He found that of a certain item there was over seven years' supply, while of other items that were part of the same assembly, there were only a few weeks' supply.

This is an extreme illustration; yet it reflects the kind of a situation that is quite common.

Over-Investment in Receivables.—The third common business ailment is in many respects similar to the second, except that it is probably more commonly encountered.

. Too great generosity in the extension of credit results in

tying up money in receivables. Properly controlled this may do little harm, but it is very easy for such a situation to become aggravated.

Extreme pressure is often brought by a concern's own salesman to allow long terms of credit and to grant unreasonable extensions of payments to favored customers. Close, careful collecting is an essential of sound business finance. Lax collecting results in a distorted financial position, and frequently in bankruptcy.

There should be a normal relation between the volume of sales and the average amount of receivables. This relation is determined, first of all, by the standard terms of credit; where the average credit term is 60 days it is reasonable to expect a larger volume of receivables than where 30 days' time is customary.

Geographical Location.—Geographical location is also important. In certain parts of the country long-term credits are expected; and even though short terms are specified, customers will feel entitled to take their own time in making payment, and will often be seriously affronted by collection effort.

In other places collectibility of accounts will depend quite directly on the prosperity of the leading industry, i.e., cotton in Georgia, oil in Oklahoma, wheat in Nebraska, automobiles in Michigan, etc.

It should be carefully borne in mind that this particular business ailment has nothing to do with *bad* debts, although the same causes are usually responsible for both. Over-investment in receivables is usually due to laxness in collection or over-generosity in assigning sales terms, often brought about by improper sales policies.

The remedy for the condition is usually to be enforced through the sales department.

Over-Investment in Plant.—The fourth common business ailment has to do with over-investment in fixed assets.

Land, buildings and machinery are very good assets with which to operate, but are very poor assets with which to pay bills. Ambitious business men, during periods of prosperity, are tempted to over-expand plant facilities, thus tying up capital in fixed assets to a greater extent than wisdom justifies.

In other instances, through pride of possession and personal vanity, business men will persuade themselves to over-invest in this class of asset.

This is a cause of business failure the importance of which it is difficult to overstate. It leaves the business in a distorted financial position and subject to grave danger at the slightest indication of unfavorable financial trends.

Only too often is a new factory or office building the tombstone of a business.

Wise business men have an instinctive appreciation of the primary importance of keeping funds liquid—keeping them “turning over” and making a profit on each turnover.

Many a large and profitable business is operated from dingy and unattractive offices and plants.

Insufficient Capitalization.—The fifth common business ailment is that of insufficient capitalization.

Many businesses are started on a “shoe string.” Often they grow quite rapidly, but because of the nature of the business or for other reasons, additional invested capital is not provided. Since the business must have sufficient capital with which to operate, the result is that such capital is secured from creditors, i.e., it is either borrowed from banks or “borrowed” from vendors under the customary privileges of ordinary trade credit. Such capital is not permanent capital and must be constantly renewed.

If too much of this kind of capital is employed, the company is continually at the mercy of its creditors. As long as general financial conditions are favorable, such a business may continue to operate without much difficulty. But at the be-

ginning of a period of depression such companies are among the first to be forced into the courts.

This is largely due to their use of temporary capital, represented by their liabilities, in the place of permanent capital, represented by shares of stock outstanding.

Different Classes of Liabilities.—Since there are different classes of liabilities, it is only fair to call attention to the fact that it is “short-time” credits that are dangerous. Capital secured through mortgages running a period of years, is, practically speaking, almost on a par with invested capital as to permanence.

When a moderate amount of such semi-permanent capital can be secured at a reasonable interest cost, its use represents good financing and reacts to the benefit of the company and stockholders.

The Armstrong Company has a capital of \$1,000,000, all common stock, and an average annual profit of \$100,000. It, therefore, earns 10% on its common stock. If the Barnes Company has the same profit and the same amount of capital, half represented by common stock and half by 5% bonds, it will have to pay out \$25,000 in bond interest leaving \$75,000 to apply to \$500,000 of the common stock, or a 15% return.

Thus, under similar conditions, the stockholders of the Armstrong Company get 10%, while the stockholders of the Barnes Company get 15%.

In a highly speculative business with widely fluctuating sales, a heavy mortgage indebtedness may easily represent a menace, since its interest requirements represent a fixed charge that must be met. Such a company should be financed through stock ownership, since dividends need not be declared at any definite time.

Other Business Ailments.—It is hardly necessary to state that these common business ailments are not the only important

ones in business. A business may have many ailments. Some of them may be complicated, but the ones that have been selected for discussion are so commonly found that they deserve to be set ahead of all the others.

In succeeding chapters the symptoms of each of these ailments and the methods used to detect them will be considered.

CHAPTER VII

BALANCE SHEET RATIOS

Instruments of Control.—A man driving an automobile has certain definite things to watch. In addition to steering the machine towards his destination, he must also be constantly on the watch for troubles which will hinder his progress.

There are certain common automobile ailments that must be constantly guarded against.

Such things as underinflated tires, insufficient water in the radiator, insufficient gasoline, or insufficient distilled water in the battery may cause trouble.

As an aid to the motorist certain control instruments are provided which are called "gauges."

Thus there is the moto-meter, the battery tester, the oil gauge, the air gauge, the speedometer, and the gasoline gauge.

None of these gauges help to make the car go. Their sole purpose is to act as instruments of control—to keep the driver informed regarding possible happenings that may stop his progress or involve him in real danger.

There is a certain resemblance between a man operating an automobile and one operating a business. And in studying analysis of financial statements it will be helpful to consider this similarity.

Common Ailments of Business.—Just as there are certain things that may happen to any automobile which will impair its efficiency, so, as was developed in the preceding chapter, there are certain common ailments in business.

These have already been described, but it will do no harm to repeat them:

1. Insufficient net profit.
2. Over-investment in inventory.
3. Over-investment in receivables.
4. Over-investment in plant.
5. Insufficient capitalization.

There is practically no business which is immune from these ailments, although some may be of greater importance in certain lines of business than in others.

This list does not include all of the various ailments which a business may have. It does represent the common ones to which every business may be subject and for which every one interested must be constantly on the watch.

Gauging Business Ailments.—If a system of gauges is important to the automobile driver, a system of gauges is of greater importance to a business manager.

A business organization is a far more complicated mechanism than any automobile.

It is far easier for a business to develop undetected ailments than for an automobile to do so.

The automobile will usually stop if anything goes wrong, but a business can sometimes survive for years handicapped by one of the common ailments without anyone really sensing the trouble.

Just as human beings are sometimes blind to their own insidious diseases, so are business managers often blind to aggravated conditions within their own businesses. Because these difficulties are frequently hard to diagnose, is the reason why special methods of analysis are needed to detect them.

For many years accountants, statisticians and credit men have been hunting for such gauges; the search is not yet finished and perhaps never will be. But their work so far has developed certain fairly reliable gauges.

Since all business activities of any kind are presented in

terms of figures, it is only natural that these warning gauges should be in the form of figures.

The procedure of modern balance sheet analysis is based on the thought that for any particular business, there are certain normal relationships, i.e., the various factors in that business should be in a harmonious relationship with one another.

Balance Sheet Relationships.—Therefore, the effort to discover gauges useful to the executive has been directed toward finding relationships between certain groups of business facts each of which will tell a plain story to the business manager, just as the height of the red line in the moto-meter tells a plain story to the automobile driver.

It would be a lengthy task to review all of the steps in the research work which has been done in this field. But in order to illustrate, consider briefly the common business problem of over-investment in inventory.

Over-Investment in Inventory.—Everyone knows how important a problem this is.

Everyone realizes that money tied up in inventory is non-productive—is not even earning bank interest. Everyone realizes that a large inventory is liable to drastic shrinkage when commodity prices drop. A large percentage of the failures in 1920 and 1921 were caused by the shrinkage of top heavy inventories.

How is one to determine whether an inventory is too large or too small?

A \$10,000,000 inventory might be small for one company, while a \$10,000 inventory might be too big for another. Much depends, therefore, on the size of the company, the amount of business they are doing, the amount of their sales, etc.

Relation of Inventory to Sale.—There is, as already explained in Chapter IV, a very direct connection between the

size of the merchandise inventory and the volume of sales. Everything else being equal, the larger sales volume the company has, the more inventory it must carry.

If a company's annual sales be divided by the amount of actual inventory, the result will be a percentage which can be used as a gauge to show whether the company is investing too much money in inventory or not.

For companies operating under similar conditions, the percentages will generally be about the same. Thus for five copper companies in 1920 the percentages were as follows:

86%
144%
145%
105%
102%

While for three general merchandising companies for the same year the figures were:

652%
511%
579%

In other words, there is a certain general uniformity of this percentage within an industry, subject to important exceptions to be discussed in Chapter XIII.

The Ratios.—Such a percentage is technically called a “ratio,” and this term will be used hereafter.

It should be borne in mind that a ratio is always a percentage obtained by dividing one figure by another, i.e., in this instance, by dividing the yearly sales by the inventory.

Average vs. Actual Inventories.—As heretofore explained, it is seldom possible to learn the average inventory of a company, and it has been customary to use the actual inventory that appears on the balance sheet at the end of the accounting period.

This may or may not be the same as the average inventory,

depending upon the nature of the business; but since a rough gauge is better than none at all, it is usually the one that must be used.

If the ratio of sales to inventory is lower than it ought to be, it may mean one of two things.

It may mean that the inventory is too large, or on the other hand, that the sales are too small. (Insufficient sales as a contributing factor to insufficient net profit is treated in Chapters XV and XVI.)

Comparison of Inventory and Current Items.—Therefore, in order to shed further light on the current status of the inventory, another ratio based upon different factors should be used.

It has been found that a certain normal relationship should exist between the inventory and the quick assets and liabilities.

Since this involves three sets of figures, it will be necessary to work out two more ratios; one, the "acid test," which shows the relationship between quick assets and current liabilities, and the other, the current ratio, which shows the relationship between the current assets (the sum of the quick assets and the inventory) and the current liabilities. These two used together will cast additional light on the inventory problem.

Thus, if the ratio obtained by dividing the quick assets by the current liabilities is abnormally low, and the ratio obtained by dividing the current assets by the current liabilities is unusually high, it tends to confirm the impression that the inventory is too heavy for the size of the business.

Here are two tests or gauges which help the analyst to decide whether a business is ailing from over-investment in inventory.

The Eight Ratios.—Without attempting to go into the reasoning which is responsible for the other ratios, a list fol-

lows of the five common business ailments together with the ratios which may be used to diagnose all except the first, which is to be treated in Chapters XV and XVI.

1. Insufficient net profit.
2. Over-investment in inventory:
 - a. Ratio of annual sales to inventory.
 - b. Ratio of quick assets to current liabilities (the "acid test").
 - c. Ratio of current assets to current liabilities.
3. Over-investment in receivables:
 - a. Ratio of annual sales to receivables.
 - b. Ratio of quick assets to current liabilities.
4. Over-investment in plant:
 - a. Ratio of annual sales to fixed assets.
 - b. Ratio of net worth to fixed assets.
5. Insufficient capitalization:
 - a. Ratio of annual sales to net worth.
 - b. Ratio of net worth to total liabilities.

The use of the "acid test," the current ratio and the ratio of annual sales to inventory has already been discussed in Chapters IV and V.

Over-Investment in Receivables.—Over-investment in inventory is perhaps the most common business mistake. But of almost equal importance is the mistake of over-investing in receivables.

By receivables is meant all indebtedness owed to a company by its customers for goods sold. Receivables usually include accounts receivable, notes receivable, and may also include sight drafts, when accompanied by bills of lading, and C.O.D. items.

Too much money becomes tied up in receivables through too liberal extensions of credit and through lax collection efforts.

When this condition exists it simply means that the company is allowing an unwarranted amount of its capital to be

“loaned” to others in such form that it does not even pay interest.

It frequently happens that a concern will permit itself to get into this condition and at the same time be so hard pressed for funds as to be forced to seek new capital, whereas the correct solution should be to release some capital from this non-productive use.

Ratio of Sales to Receivables.—The first test is to compare the receivables with the annual sales.

Since the receivables result from sales there should be a certain relationship between the two. This is determined by dividing the annual sales by the actual amount of receivables as shown on the last balance sheet, although this may be deceptive in certain seasonal lines of business.

If the resulting percentage should be 100%, it would mean that the equivalent of a whole year's sales was tied up in receivables. If 200% it would indicate that six months' sales were tied up in receivables, and so on.

Naturally, for any line of business this depends on the average terms of sales. It would be smaller for long terms, and it would be larger if 30 days or less was the usual credit extension.

This percentage if too small may indicate that the receivable item is too large.

As a check, therefore, the current ratio sheds further light on this subject, since with most business concerns current assets consist very largely of receivables.

Over-Investment in Plant.—Another very common error is to build up too heavy a plant investment account.

It is a temptation to many business executives to let their pride of ownership get the better of their good judgment and to invest large sums of money in land, buildings, machinery, office equipment and other fixed asset items.

They seem to forget that their plant is merely a means

by which raw materials are to be re-worked and sold for a profit, and that their plant should not be any more elaborate than is necessary to accomplish this purpose.

From the accounting viewpoint immediately after a fixed asset is bought, money invested in it is still an asset of the same value as it was before. But from the financing viewpoint there is a great difference, since cash can be used to pay bills or take advantage of special business opportunities, whereas the money invested in buildings remains "frozen" permanently and when it is most needed it is often most difficult to realize.

Ratio of Sales to Fixed Assets.—There should be a distinct relationship between the size of the plant and the volume of a company's sales, i.e., the more goods sold, the larger the plant needed to make or handle the goods to sell.

This may be expressed as a ratio between sales and fixed assets, the total amount of the annual sales being divided by the book value of the fixed assets. The normal and desirable situation is for the sales to increase at a somewhat faster rate than the fixed assets, so that if from year to year this ratio is increasing it will be a favorable sign. If it is constantly decreasing, it is usually unfavorable.

Since the change in the ratio of sales to fixed assets may be due to fluctuation in sales volume rather than to increases in fixed asset investment, it is also customary to compare the fixed assets with the net worth of the company.

Ratio of Net Worth to Fixed Assets.—This ratio is obtained by dividing the net worth by the value of the fixed assets.

If over a period of time this ratio increases, it may be taken as a favorable indication since it shows that the net worth is increasing at a faster rate than the fixed asset investment.

Of course, this is only true if the increases in net worth

are the result of earnings. If they are the result of stock sales, a different, although perhaps equally favorable, conclusion might be reached.

Under-Capitalization.—Ambitious but unwise managers of small companies frequently attempt to do a larger amount of business than they are financed to handle.

This results in overworking their capital and is given by the commercial agencies as one of the most frequent causes of business failures. To compare the amount of capitalization with the amount of sales is a natural step.

Capitalization for this purpose is the net worth of the company, since retained earnings appearing as surplus are a form of capital of the same general nature as the original investment made by the stockholders.

Ratio of Sales to Net Worth.—This ratio is obtained by dividing the annual sales by the net worth.

Up to a certain point an increase in this ratio is a favorable indication since it shows aggressiveness on the part of the manager. Past that point it represents a warning signal.

In order to determine whether the ratio is increasing too rapidly, it is wise to examine another ratio which usually furnishes additional evidence bearing on the point.

Ratio of Net Worth to Liabilities.—This ratio is the one between net worth and total liabilities, and is obtained by dividing the net worth by the total liabilities.

As already set forth, each item on the liability and capital side of the balance sheet represents a source of funds. Liabilities represent funds temporarily loaned by creditors, even though these funds happen to be in the form of merchandise or supplies. The capital stock represents funds permanently loaned by the stockholders.

Since it is usually safer for a company to secure most of its capital from stockholders rather than from creditors, it

will be seen that a consistent increase in this ratio from year to year can be taken as a favorable indication, whereas a consistent decrease may represent a danger signal.

The above two ratios taken together shed considerable light on the question of insufficient capitalization.

Use of More Than One Ratio Necessary.—The foregoing discussion has involved eight different ratios.

These ratios are valuable to the analyst only when they are used intelligently.

In order to use them intelligently it must be understood that a ratio is after all only a percentage and always involves two factors—the dividing figure and the one divided. Thus a single ratio expresses two varying amounts.

Hence no definite conclusions should be made from the study of one of these ratios alone. Ordinarily it requires two ratios in order to insure even a fair degree of certainty as to the diagnosis of a business ailment.

Intelligent use of these ratios also requires that the user understand that they are rough and only partially accurate gauges, and that their reliability depends upon numerous factors.

Ratios Give Warning.—If these ratios are used in the same way as the control gauges of an automobile are used—to give warning of approaching trouble—they perform a very satisfactory service.

The fact that the moto-meter on a car shows overheating is merely a warning which must be followed by further investigation.

The trouble may come from insufficient water in the radiator, insufficient lubrication, breakage of the fan belt or other causes. No driver could find out exactly the trouble with the car by merely observing the height of the red line in the moto-meter.

Similarly with ratios. They merely point out symptoms

more or less accurately, but they do not furnish a complete diagnosis.

The ratios can be no more accurate than the original figures from which they are calculated. Balance sheet values in many instances are only shrewd estimates, and sometimes they are far from reflecting the truth.

These warning statements are sufficiently justified, because some authors on this subject, without actually saying so, appear to imply that balance sheet ratios are a new "cure-all" for business ills—a supposition which is most decidedly not true.

Intelligent Use of Ratios.—There are many other balance sheet ratios which have been suggested from time to time by various authors, none of which seem to be sufficiently reliable or important to be mentioned here.

The eight which have been discussed are not all of equal importance, as will appear later. But they probably represent the eight best and most practical of all the balance sheet ratios which have been suggested.

The next few chapters will discuss these ratios in much greater detail. They represent an important and fascinating study. In the hands of experts they often afford an uncanny insight into the affairs of a company whose bare figures tell but little.

Used with intelligence and a liberal amount of common sense, it is possible to develop quite accurate conclusions as to business trends and conditions.

This is particularly true when the ratios are used in searching for specific symptoms of common business ailments.

CHAPTER VIII

HISTORICAL ANALYSIS OF BALANCE SHEETS— RATIO METHOD

Standard Ratios.—The point has already been brought out that all measuring is a matter of comparison, so in order to measure balance sheet ratios, it is necessary to have something to compare them with.

Most balance sheet ratios taken from a single balance sheet are practically meaningless until compared with something else.

If there were standard ratios for every kind of business, just as there is a standard yard-stick or a standard pound weight, there would be something definite with which to compare ratios from a single balance sheet.

But as will be seen later, significant standard ratios are difficult, if not almost impossible, to obtain. The best substitute is to compare the ratios from successive balance sheets of the same company.

Historical Analysis.—Most ratios standing alone mean almost nothing, but compared with similar ratios of the year before, two years before, etc., may assume the greatest significance.

The Boston Machine Company's balance sheets for three years developed the following figures:

RATIO SALES TO INVENTORY

1922	200%
1923	250
1924	300

Perhaps an "ideal" figure would be 500%. Nevertheless the trend of the figures shown is good, and as long as they

are on the up-grade, the situation may be viewed more optimistically than if the following had been the ratios:

1922.....	550%
1923.....	500
1924.....	450

The vitally important thing is trend—first, last, and always.

And to get any real meaning out of ratio figures, it is necessary to calculate them not merely for one year, but for two or more years.

And this brings up a point of the utmost importance.

Uniformity of Balance Sheets.—It is essential that the various groups of assets and liabilities be made up of the same kind of items for each of the various years.

This may sound elementary, but it represents a real source of difficulty in this type of analytical work, since there is hardly any concern which does not change its accounting methods from time to time. Even if the accounting methods remain unchanged over a period of years, changes in the accounting personnel may result in different groupings in the balance sheet.

While it may not be possible to insure that identical classification of accounts be maintained from year to year, nevertheless unusual care should be exercised that balance sheet groupings from year to year are similar.

Optional Classification.—A balance sheet for one year may include certain items in current assets that a later balance sheet may show in some other group.

Either arrangement may be justifiable, since the arrangement of a balance sheet is, to some extent at least, a matter of individual taste and judgment. It is not safe, therefore, to use the group totals as they appear on the balance sheet, but each balance sheet should be recast in such a way that the groupings from year to year are uniform.

Interpreting Account Names.—The actual facts about every kind of asset and liability are of much more importance than the names of the accounts.

Thus, a mortgage, without an offsetting sinking fund, may be a long-time liability or a current liability, depending upon its due date and attendant circumstances. A “reserve” may be a deduction from an asset, as in the case of a “reserve for depreciation;” or it may be a liability, as in the case of a “reserve for taxes;” or it may be a net worth item, as in the case of a “sinking fund reserve.”

The name of the item appearing on the balance sheet, therefore, does not always tell in just what group it really belongs.

Working Sheet.—Where a series of balance sheets of different years are to be analyzed, the reclassification of the items may often be simplified by the use of a working sheet which provides a wide left-hand column for the various groups of items and a series of money columns, one for each year.

The figures contained on the various balance sheets can be transferred into the standard groupings as given on the working sheet, which will then furnish uniform group totals for ratio calculations.

Slide Rule Calculation.—The calculations represent simple division, and can best be made with a slide rule.

Dividing on a slide rule is rapid and easy. The slide rule is not a mysterious or complicated instrument, and its use, so far as multiplication and division are concerned, can be completely mastered in 10 minutes by a grade-school graduate. Its accuracy is quite sufficient for statement analysis purposes.

Slide rules can be purchased at engineering supply houses and many book stores at prices ranging as low as \$1 for the cheapest make.

Effect of Kind of Business.—Since balance sheet ratios and balance sheet figures merely reflect business activities, anyone attempting to analyze balance sheets should have a general idea as to the important business factors involved in each industry.

The balance sheets of a bank, a railroad and an installment house have but little in common. Similarly balance sheets of other corporations differ from one another. The contents and groupings of a balance sheet are largely dependent upon the business policies of the company and trade customs of the industry.

Where long-term credits are given, the effect on the balance sheet is very noticeable, the item of accounts or notes receivable usually being very large, and the amount of current indebtedness quite heavy.

Where a product is sold practically on a cash basis, an entirely different balance sheet is to be expected. It is clearly evident, therefore, that ratios which might be favorable for one kind of a business might be very poor for another kind of business.

This is clearly confirmed by published facts.

Eighty-seven companies noted by J. H. Bliss in "Financial and Operating Ratios in Management" fell into 22 groups. The average ratio of sales to accounts receivable for all of them covering a six-year period was about 682%.

It is interesting to observe some selected groups that were above and below this average:

INDUSTRIES SHOWING RATIOS ABOVE AVERAGE

Auto and Truck Manufacturing.....	858%
Auto Accessory Manufacturing.....	967
Copper Mining and Manufacturing.....	1430
Drug Manufacturing and Distributing.....	883
Mail Order Merchandising.....	938
Sugar Product and Refining.....	1304
Tobacco Products.....	910

INDUSTRIES SHOWING RATIOS BELOW AVERAGE

Chemical Products.....	370%
Coal—Bituminous	341
Cotton Goods Manufacturing.....	380
Electrical Machinery Manufacturing.....	353
Railway Equipment.....	429
Rubber and Tire Manufacturing.....	492

Sales Policies.—Sales policies may have a very important effect on balance sheet ratios even for companies in the same line of business.

One company may find it desirable to sell to jobbers and thus collect payment quickly. This tends toward high ratios of sales to receivables and to inventory. Others may sell directly to the retail trade and keep heavy stocks of goods in distributing warehouses at various strategic points and the ratios tend to become lower.

Others may go a step further and establish their own retail stores, which means a further increase in inventories and also in fixed asset items.

Manufacturing Policies.—Finally, manufacturing policies must be considered.

A manufacturer may attempt to control his sources of raw materials which means that he may have to operate mines, blast furnaces, railroads, mills, and a variety of other industries, while his competitor may buy the corresponding products on the market.

It is to be expected that the balance sheets of two such companies will present a different appearance and that it will be difficult to make comparisons between their ratios.

Illustrative Figures.—Figures furnishing considerable food for thought are quoted by J. H. Bliss from his study of published reports. These figures have to do with the ratios of sales to fixed assets of 94 corporations divided in 24 lines of business showing an average ratio of 183%.

Some of the groups whose ratios were above the average are as follows:

INDUSTRIES SHOWING RATIOS ABOVE THE AVERAGE

Auto and Truck Manufacturing.....	295%
Auto Accessories.....	477
Cotton Goods Manufacturing.....	270
Drugs.....	470
Electrical Machinery.....	455
General Merchandising.....	1047
Mail Order Merchandising.....	974
Retail Chain Stores.....	896
Slaughtering and Meat Packing.....	962

The merchants in the above list show much better ratios than the manufacturers, as would be expected.

Industries with simple manufacturing processes also show good ratios.

Looking at the other side of the picture for a moment the following situation is found:

INDUSTRIES SHOWING RATIOS BELOW AVERAGE

Coal—Anthracite.....	57%
Coal—Bituminous.....	34
Iron and Steel Manufacturing.....	70
Lead Production and Manufacturing.....	75
Petroleum Oil.....	75
Paper Manufacturing.....	101
Sugar Production and Refining.....	111

The mining and oil companies have their heavy holdings of land to account for their low ratios. Iron, steel, paper and sugar manufacturing require complex and expensive machinery.

Turning finally to the inventory situation, there are the statistics for 94 companies divided into 24 groups with an average ratio of sales to inventory of 421%. Some of the groups are as follows:

INDUSTRIES SHOWING RATIOS ABOVE AVERAGE

Auto Accessories.....	425%
Chemical Products.....	542
Coal—Anthracite.....	1422

Coal—Bituminous.....	893
General Merchandising.....	542
Retail Chain Stores.....	593
Slaughtering and Meat Packing.....	748

The reason for most of these high ratios is obvious. It will be interesting, however, to compare the types above with those in the following list:

INDUSTRIES SHOWING RATIOS BELOW AVERAGE

Automobile and Truck Manufacturing.....	317%
Cotton Goods.....	342
Electrical Machinery.....	267
Lead Production.....	221
Leather.....	155
Machinery.....	216
Petroleum.....	235
Rubber and Tires.....	279
Tobacco.....	177

Some of these companies have to purchase far in advance either to insure their supply or because of buying crops.

With others, such as automobile manufacturing and electrical machinery, the processes of manufacturing are long and complicated, while with still others, the element of time is part of the process involving large stores in storage, as in the case of ageing tobacco and tanning hides.

An Important Caution.—The figures that have been quoted in this chapter are shown solely for their comparative value and not their absolute accuracy. It is doubtful whether such average percentages can be used as measures, but there is no doubt that a comparative survey of them is stimulating and broadening, and throws considerable light on the relation between ratios and the kind of business conducted by each group.

CHAPTER IX

HISTORICAL ANALYSIS OF BALANCE SHEETS— RATIO METHOD (Continued)

Illustrating Use of Ratios.—The best way to understand the method of constructing and using balance sheet ratios is to follow a hypothetical case.

Below are given four successive balance sheets of the Ames Manufacturing Company.

The Ames Manufacturing Company actually exists and with a few unimportant changes the figures given are actual. The name, however, is fictitious and the dates given are not the actual dates. This has been done to conceal the identity of the corporation since the figures are shown merely to illustrate method.

After examining the ratios the reader can compare his final conclusions with those first formed, and thus gain an appreciation as to the value of ratios in balance sheet analysis.

THE AMES MANUFACTURING COMPANY COMPARATIVE BALANCE SHEET As of December 31

<i>Assets</i>	1921	1922	1923	1924
Cash.....	\$ 4,652	\$13,371	\$ 7,190	\$10,512
Accounts Receivable (Net).....	14,468	8,217	5,629	5,857
Net Quick Assets.....	\$19,120	\$21,588	\$12,819	\$16,369
Inventories.....	17,556	20,607	28,077	22,210
Total Current Assets.....	\$36,676	\$42,195	\$40,896	\$38,579
Fixed Assets (less Depreciation).....	17,922	25,707	36,163	37,290
Prepaid Expense.....	76	213	2,545	2,459
Total Assets.....	<u>\$54,674</u>	<u>\$68,115</u>	<u>\$79,604</u>	<u>\$78,328</u>

Liabilities and Capital

Notes Payable—Trade.....	\$ 1,000	—	\$ 3,000	\$ 1,000
Notes Payable—Bank.....	4,000	\$ 4,000	3,000	2,000
Accounts Payable.....	7,000	4,000	8,000	5,000
Dividends Payable.....	2,000	—	2,000	2,000
Accrued Liabilities.....	128	690	337	248
Current (and Total) Liabilities....	<u>\$14,128</u>	<u>\$ 8,690</u>	<u>\$16,337</u>	<u>\$10,248</u>
Capital Stock Outstanding.....	\$50,000	\$50,000	\$50,000	\$50,000
Surplus (Deficit).....	9,454	9,425	13,267	18,080
Total Net Worth.....	<u>\$40,546</u>	<u>\$59,425</u>	<u>\$63,267</u>	<u>\$68,080</u>
Total Liabilities and Net Worth...	<u>\$54,674</u>	<u>\$68,115</u>	<u>\$79,604</u>	<u>\$78,328</u>
Sales.....	<u>\$52,088</u>	<u>\$66,383</u>	<u>\$90,652</u>	<u>\$96,691</u>

Ratio of Quick Assets to Current Liabilities.—The first ratio to determine is that of quick assets to current liabilities.

Quick assets will be divided by the current liabilities in order to determine the “acid test” ratios. (Slide-rule calculation gives sufficient accuracy for every purpose. Fractions of a per cent have been omitted) :

1921.....	$\frac{\$19,120}{\$14,128} = 135\%$
1922.....	$\frac{\$21,588}{\$ 8,690} = 248\%$
1923.....	$\frac{\$12,819}{\$16,337} = 78\%$
1924.....	$\frac{\$16,369}{\$10,248} = 160\%$

To state these figures somewhat differently, they simply mean that in 1921 for every dollar of current liabilities there was \$1.35 in quick assets.

In 1922 for every dollar of current liabilities there was \$2.48 of quick assets.

In 1923 for every dollar of current liabilities there was \$.78 of quick assets, and in 1924 for every dollar of current liabilities there was \$1.60 in quick assets.

In three out of the four years there were more quick assets than current liabilities by a substantial margin. In the year 1923, however, there was a substantial increase in current lia-

bilities and a decrease in quick assets, which resulted in a lower ratio.

Ratio of Current Assets to Current Liabilities.—The next ratio to determine is that of current assets to current liabilities:

1921	$\frac{\$36,676}{\$14,128} = 260\%$
1922	$\frac{\$42,195}{\$8,690} = 486\%$
1923	$\frac{\$40,896}{\$16,337} = 250\%$
1924	$\frac{\$38,579}{\$10,248} = 376\%$

Ratio of Sales to Receivables.—The third ratio is that of sales to receivables:

1921	$\frac{\$52,088}{\$14,468} = 360\%$
1922	$\frac{\$66,383}{\$8,217} = 808\%$
1923	$\frac{\$90,652}{\$5,629} = 1610\%$
1924	$\frac{\$96,691}{\$5,857} = 1651\%$

Ratio of Sales to Inventory.—The fourth ratio is that of sales to inventory:

1921	$\frac{\$52,088}{\$17,556} = 297\%$
1922	$\frac{\$66,383}{\$20,607} = 322\%$
1923	$\frac{\$90,652}{\$28,077} = 323\%$
1924	$\frac{\$96,691}{\$22,210} = 435\%$

Ratio of Sales to Net Worth.—The fifth ratio is that of sales to net worth:

1921	$\frac{\$52,088}{\$40,546} = 128\%$
1922	$\frac{\$66,383}{\$59,425} = 112\%$

1923	$\frac{\$90,652}{\$63,267} = 143\%$
1924	$\frac{\$96,691}{\$68,080} = 142\%$

Ratio of Net Worth to Fixed Assets.—The sixth ratio is that of net worth to fixed assets:

1921	$\frac{\$40,546}{\$17,922} = 226\%$
1922	$\frac{\$59,425}{\$25,707} = 231\%$
1923	$\frac{\$63,267}{\$36,163} = 175\%$
1924	$\frac{\$68,080}{\$37,290} = 182\%$

Ratio of Net Worth to Liabilities.—The seventh ratio is that of net worth to total liabilities. In this illustration the total liabilities are the same as current liabilities, but this might not be true. In other instances there might exist a mortgage or bonds payable or a purchase money obligation which would not form part of current liabilities but would have to be included in total liabilities.

1921	$\frac{\$40,546}{\$14,128} = 287\%$
1922	$\frac{\$59,425}{\$8,690} = 684\%$
1923	$\frac{\$63,267}{\$16,337} = 387\%$
1924	$\frac{\$68,080}{\$10,248} = 664\%$

Ratio of Sales to Fixed Assets.—The eighth and last ratio is that of sales to fixed assets:

1921	$\frac{\$52,088}{\$17,922} = 291\%$
1922	$\frac{\$66,383}{\$25,707} = 258\%$
1923	$\frac{\$90,652}{\$36,163} = 251\%$
1924	$\frac{\$96,691}{\$37,290} = 259\%$

It has been pointed out by J. H. Bliss, in "Management Through Accounts," that:

The effect of changing price levels on sales must not be overlooked. If a business has a measure of physical volume such as cases, tons, hundredweight, etc., it is better to state this ratio as the cases, hundredweight, or other units of volume, per dollar of fixed property investment. In this manner the ratio would be figured on bases unaffected by changing price levels. Where statistics on physical volume are not available, it may be approximated by eliminating from the sales the effect of changes in average price levels. This may readily be done by applying a price index figure to the sales volume. For most industries published price indexes may be used.

Mixed Production.—Comparatively few business organizations are able to express their sales in terms of a single unit because they market a diversified line of products.

Thus, the United States Rubber Company is engaged in manufacturing rubber foot wear, mechanical goods, tires and also supplies needed in the manufacturing of rubber goods. It would be difficult if not impossible for the outside analyst to convert all these various products into terms of a single unit.

This same condition holds true for the majority of concerns.

There are a few, of course, which produce one and only one commodity. The Ford Motor Company may be considered in this class and also certain producers of raw material, such as mining companies, lumber companies, etc.

Furthermore the outside analyst very rarely has access to the statistics of physical production.

Adjusting Sales by Price Indexes.—Reverting to the second suggestion, that "the effect of changes on average price levels may be eliminated from sales by applying price index figures to sales volume," certain grave difficulties must be faced.

Perhaps the principal difficulty has to do with the fact that

published price indexes are nearly all concerned with simple materials or raw materials and very few with manufactured products. Therefore, even though a company under analysis made but one product, if that product was not represented in the published price indexes, this plan could not possibly be applied.

The next objection refers to the fact that averages are always dangerous when applied to the interpretation of a specific situation. Price indexes are, of course, averages.

It is, therefore, doubtful whether this suggested plan of adjusting sales is feasible even in the relatively few instances where it could be used.

Purpose of the Analysis.—Furthermore, there is some question as to whether such a plan would actually serve to promote the purpose of the analyst.

His interest in the analysis is largely financial. The ratio of fixed assets to sales is shown in terms of dollars and is, therefore, stated in terms of finance.

If such a ratio were constructed by dividing dollars of fixed assets into the number of actual units of production, a useful ratio might be obtained to indicate the operating efficiency of the plant. But this is an internal problem that the analyst is not usually interested in.

The attention of the reader is again called to the fact that this entire discussion of financial analysis is considered primarily from the viewpoint and opportunities of the external analyst, and not from the viewpoint of the internal analyst, who is almost wholly concerned with the welfare of his particular company.

Over-Investment in Inventory.—The next step is to examine the eight ratios in their relation to four of the five common business ailments, omitting the first one of "insufficient net profits."

An overgrown inventory is one of the most common, and at the same time a very dangerous business symptom.

To diagnose this condition, first examine the ratio of sales to inventory:

Year	Ratio
1921.....	297%
1922.....	322
1923.....	323
1924.....	435

Since this ratio is constantly increasing, it shows that the inventory is not increasing as fast as the sales. Anyone considering such a ratio should bear in mind that the inventory at the end of the year may be quite at variance with the average inventory during the year.

Also the inventory is usually valued at cost, while the sales are expressed in terms of cost plus the mark-up, which is supposed to be sufficient to cover all operating expenses and still leave a margin for profit.

The factors which influence the amount of the mark-up may vary from year to year, which may result in a situation where an equal number of units of product are sold in two successive years but where the annual sales in dollars are different.

Usually the analyst must accept the figures as submitted, but he should constantly bear in mind that the factors mentioned may distort his ratios to a point where they represent only rough guides.

The figures as given appear to show a healthy inventory trend, but this may be verified by examining the two ratios: (1) Quick assets to current liabilities, and (2) current assets to current liabilities:

Year	Ratio No. 1	Ratio No. 2
1921.....	135%	260%
1922.....	248	486
1923.....	78	250
1924.....	160	376

Reducing Ratios to Common Base.—These tell their own story, giving no indication that the inventory is out of propor-

tion, but the variations between the two sets of ratios may be clearer if they are reduced to a common base.

This may be done by considering the 1921 ratios as being 100%. To do this, divide all the No. 1 ratios above by 135 and all of the No. 2 ratios above by 260, with the following results:

	No. 1 Ratio	No. 2 Ratio
1921.....	$\frac{135}{135} = 100\%$	$\frac{260}{260} = 100\%$
1922.....	$\frac{248}{135} = 184\%$	$\frac{486}{260} = 188\%$
1923.....	$\frac{78}{135} = 58\%$	$\frac{250}{260} = 97\%$
1924.....	$\frac{160}{135} = 119\%$	$\frac{376}{260} = 145\%$

The adjusted No. 2 ratios are increasing faster than the No. 1. Since the only difference between them is the inventory item, it seems clear that swelling inventories are responsible for the increase.

The situation is, however, far from alarming, and by no means contradicts the conclusions already formed. The difference between 119% and 145% is moderate. Had these figures been considerably farther apart, the interpretation might have been less favorable.

Ordinarily it will not be necessary to go through the last mathematical step of reducing the ratios to a common base, since a mere inspection of the two sets of actual ratios themselves will tell a sufficiently complete story.

From this study a reasonably safe conclusion may be drawn that the inventory of the Ames Manufacturing Company shows a satisfactory trend.

But if the following ratios from the cotton goods business were offered for analysis, what would be the conclusion?

	1913	1914	1915
Ratio Sales to Inventory.....	595%	317%	288%
Ratio Quick Assets to Current Liabilities.....	74	45	47
Ratio Current Assets to Current Liabilities.....	125	116	120

The last two sets of ratios may be reduced to a comparable basis as follows:

	Acid Test Ratio	Current Ratio
1913.....	$\frac{74}{74} = 100\%$	$\frac{125}{125} = 100\%$
1914.....	$\frac{45}{74} = 61\%$	$\frac{116}{125} = 93\%$
1915.....	$\frac{47}{74} = 64\%$	$\frac{120}{125} = 96\%$

The ratio of sales to inventory shows a bad condition, and the adjusted ratios of quick assets to current liabilities and of current assets to current liabilities confirms the conclusion, the difference between 64% and 96% being relatively large.

Over-Investment in Receivables.—The next question to consider is whether the Ames Manufacturing Company is tying up too much money in receivables.

The first ratio which has a bearing on this problem is the one of sales to receivables:

Year	Ratio
1921.....	360%
1922.....	808
1923.....	1,610
1924.....	1,651

This ratio is constantly increasing, which simply means that sales are increasing faster than the volume of receivables.

For the year 1921 there was \$3.60 of sales for every dollar of receivables—offhand, a rather poor record. To state the situation a little differently, it means that more than three months' sales were tied up in receivables (\$3.60 divided by 12 months equals \$.30. \$1 is more than three times \$.30).

The steady improvement up to 1924, when there was \$16.51 of annual sales for every dollar of receivables, is reassuring. In 1924 only about three weeks' sales were tied up (\$16.51 divided by 52 weeks equals approximately \$.32. \$1 is about three times \$.32).

It should be remembered that changes in these ratios may be

influenced by the following factors, which may not be known to the analyst :

1. The terms of sale may have been changed.
2. Sharp increases or decreases in sales prices may have been made during some of the years, which would result in the receivables (because they largely represent recent sales) reflecting the price changes to a greater extent than the annual sales do.
3. The basis for figuring the provision for doubtful accounts may have been changed to a disturbing degree.

To check the foregoing figures consider again the ratio of quick assets to current liabilities :

Year	Ratio
1921.....	135%
1922.....	248
1923.....	78
1924.....	160

These figures tell no story to contradict what has already been learned, and it is fair to conclude that the Ames Manufacturing Company shows no trend toward over-investment in receivables.

But less favorable conclusions would prevail if the ratios of sales to receivables were as follows from the coal mining industry :

Year	Ratio
1918.....	507%
1919.....	487
1920.....	383
1921.....	361

The following ratios are from the railway equipment business :

Year	Ratio
1919.....	987%
1920.....	341
1921.....	290

The following ratios are from the meat packing industry:

Year	Ratio
1918.....	1,140%
1919.....	890
1920.....	760
1921.....	570

Over-Investment in Fixed Assets.—Coming back to the Ames Manufacturing Company, the next symptom to search for is over-investment in fixed assets. The first ratio to examine is that of sales to fixed assets.

Year	Ratio
1921.....	291%
1922.....	258
1923.....	251
1924.....	259

These figures show no particular trend. They indicate a fairly harmonious relation between the rate of increase in volume of sales and volume of fixed assets. There was a moderate unfavorable tendency the first three years, but an improvement was shown in the fourth.

It seems evident that fixed assets are not being increased too fast, but before reaching a final conclusion the increase in fixed asset investment should be compared with the rate of increase in net worth. The increase in fixed asset accounts might not be out of harmony with sales and still might be inconsistent with net worth, thus resulting in an unbalanced financial position.

The ratios of net worth to fixed assets follow:

Year	Ratio
1921.....	226%
1922.....	231
1923.....	175
1924.....	182

The first set of ratios indicated a slight unfavorable trend. These confirm that the fixed asset increase is somewhat out of

proportion to net worth. This is probably not a very alarming condition, since an improvement is noted in the 1924 figure, but it puts the analyst on guard.

Interpreting the Ratios.—Here is a good example of the function of ratio analysis. An unfavorable trend has been disclosed, but does this mean that the Ames Manufacturing Company is “going broke”? Not at all. It is merely a warning indicator and its purpose is to fix the starting point for further and more detailed investigation.

There is nothing conclusive about the findings so far. The analyst has merely learned in what direction to investigate and what general symptoms are evident.

It occasionally happens that a sharp decrease in this ratio may be due to a heavy but legitimate investment in plant toward the end of a fiscal year, the effect of which will be to increase sales during years following.

Also companies who own properties not used for direct operating purposes, such as land held for future expansion, may sell such properties. This might affect the ratios materially without carrying important significance.

The matter of uniformity of depreciation policy should also be borne in mind by the analyst.

The following ratios of sales to fixed assets come from the automobile accessory business:

Year	Ratio
1917.....	802%
1918.....	683
1919.....	396
1920.....	341
1921.....	137

Here the ratios clearly point out a dangerous tendency.

Following are similar ratios from a shoe manufacturing company which are also unfavorable but not positively alarming:

Year	Ratio
1919.....	586%
1920.....	563
1921.....	430

Next follow the ratios of one of the largest electrical machinery manufacturers:

Year	Ratio
1917.....	496%
1918.....	485
1919.....	446
1920.....	406
1921.....	322

These are interesting because they show a very gradual trend. In many companies where the figures are not closely analyzed, such a trend might continue unnoticed for a long time until a really dangerous situation developed.

Insufficient Capitalization.—The question as to whether the Ames Manufacturing Company is sufficiently capitalized is the next one for investigation.

The ratio of net worth to total liabilities is quite significant, because it shows the relation between permanent capital supplied by stockholders and temporary capital supplied by creditors. Within reason, the larger the proportion that permanent capital bears to temporary capital, the better.

A decreasing ratio is unfavorable because it shows that the company is pointed toward a situation of being under-supplied with permanent capital and thereby being compelled to make up the deficiency by increasing its liabilities:

Year	Ratio
1921.....	287%
1922.....	684
1923.....	387
1924.....	664

The general tendency is favorable, because the ratio is becoming larger.

To check these findings sales may be compared with net worth:

Year	Ratio
1921	128%
1922	112
1923	143
1924	142

A reasonable increase in this ratio is usually a favorable indication, but too great an increase shows that the company is heading toward the point of doing more business than its capital justifies. In this instance there is no indication that the Ames Manufacturing Company is tending towards undercapitalization.

Ratio Interpretation.—This study of the ratios of the Ames Manufacturing Company has been described at length to show just how ratios are prepared, used, and interpreted.

This interpretive work must be supported at all times by common sense. It is easy, when working with ratios, to “get off the track” and reach wild conclusions.

Important issues frequently hang on the results of this analysis work. A wrong interpretation may easily involve thousands of dollars in credit unwisely granted, investments unwisely made, etc.

After making his study of the ratios, the analyst may well “stop, look, and listen,” and apply the test of common sense to his conclusions.

The Value of Ratios.—A complete diagnosis of four of the five principal ailments of business has been made. It is a fairly conclusive diagnosis. It has been made entirely through the study of ratios.

This simply means that a method of technique or analysis has here been presented which, if intelligently used, is of great value to the accountant, public or private, and to the business executive, as well as to investors, bankers, credit men, etc.

This method is one commonly used by advanced analysts, and while it has certain faults, it is quite effective and practical. It leads directly into the subject of standard ratios which is to be discussed in Chapter XIII. A better and simpler method of historical analysis (analysis of successive balance sheets of the same company) is developed in Chapters XI and XII.

Chapter X discusses the relation of the ratios to the common business ailments from the viewpoint of the relative seriousness of the ailments.

This is naturally an important study and one which will enable the analyst to interpret balance sheets with much greater sureness and accuracy.

CHAPTER X

COMPARATIVE SERIOUSNESS OF BUSINESS AILMENTS

Purpose of Diagnosis.—A physician might be thoroughly trained in all various methods of diagnosing human ills; he might be thoroughly skilled in the technique of searching for symptoms; his program of testing might be ultra scientific; and yet if he did not know the relative seriousness of the various diseases much of his work would be valueless.

This is equally true of the balance sheet analyst. He searches for certain common business ailments. Certain methods are devised to aid him in his search. These methods involve the use of ratios and are presumed to be helpful to him in his diagnosis.

And yet some of these ailments may be of but minor importance, while others may be quite serious.

X A doctor may have an accurate method of diagnosis for measles and another equally accurate method of diagnosis for typhoid fever. Both methods may be of equal accuracy, and yet the diseases which they indicate are not comparable in their seriousness.

Comparative Importance of Ailments.—Therefore, in order to use balance sheet ratios intelligently, the analyst should know something of the comparative seriousness of the common business ailments.

Some of them may be of moderate importance to be compared to minor human ailments, and some of critical importance to be compared to dangerous diseases.

Field for Research.—It is doubtful whether anyone can answer this question of relative importance with any degree of certainty.

Here lies a wonderful field for business research. Were it possible for some statistical organization to have current access to all the financial statements of all the business concerns in the United States, it might contribute some remarkable information to the sum total of business knowledge—information so vital that its importance is difficult to estimate—information that would probably strike deep into the very roots of business itself.

Business men will and should assume certain risks in conducting their enterprises, but with the knowledge such a research would give they would be able to assume such risks intelligently. X

Measurement of Business Risks.—If the over-investment in inventory is only moderately dangerous, the business man might then compare the risks he takes through swelling his inventory with the extra profits which might be made through a rising market.

Given the proper information, he might decide not to take such great risks for a modest profit or vice versa.

Perhaps one reason business men disbelieve in some phases of balance sheet analysis and prefer to use their own "rule of thumb" judgment, may be that they have an instinctive understanding that while balance sheet ratios point out dangers, the seriousness of the dangers themselves is not capable of measurement.

Common Sense Analysis.—While the present state of knowledge does not appear to give much information as to the relative seriousness of the common business ailments, still it is true that common sense alone does shed some light on this problem.

Common sense tells, for example, that over-investment in plant is a much more serious condition than over-investment in inventory for the very simple reason that an inventory is X

in a constant state of movement and given sufficient time will usually be liquidated.

Inventories Self-Liquidating.—Over-investment in inventory does not necessarily have a permanent effect upon the condition of a business.

Inventories may be too high at one time and at the expiration of a few months may be entirely too low. This is due to the character of the asset itself.

In other words, over-investment in inventories is not an incurable disease. It represents a condition which once detected can be remedied. The remedy may involve a loss of money, to be sure, but except in aggravated instances, it is not likely to involve serious financial embarrassment.

Of course, when an inventory is swollen with obsolete, unnecessary, or unsalable items, or has been bought for speculative purposes to a highly inflated point, having been financed to that point through short-time loans, and the business is then hit by a slump in sales as a result of a depression in general conditions, it is unquestionably at the mercy of its banker or trade creditors, and may naturally expect a call from the sheriff.

Over-Investment in Receivables.—But on the whole, swelling inventories usually are only dangerous when unrecognized. Much the same thing is true of over-investment in receivables.

To permit too much working capital to be concentrated in the form of receivables where it is not even earning interest, is unquestionably bad business policy. It is a fundamental of business management to collect closely and to keep the investment in receivables at a minimum.

The failure to do this is not necessarily fatal, but it may cause temporary embarrassment and in aggravated cases even bankruptcy. Assuming that all the receivables are good and that they are reasonably self-liquidating, all that is then re-

quired to cure conditions is a change in collection or sales policies and the passage of a few months' time.

This particular ailment is nearly always chargeable against the sales department of a business, which in its eagerness to build up a big volume of business is continually fighting for over-liberality of credit—fighting to have credit accommodations continued to doubtful customers, and longer and longer credit terms extended to good customers. *Cause*

When this cause of swollen receivables is removed and the sales policy is readjusted, a long step is taken toward curing this evil.

Over-Investment in Plant.—But the situation with respect to over-investment in plant is an entirely different proposition.

Money put into bricks, mortar and steel is permanently invested, or practically so, while money tied up in receivables or inventories will usually be coming back in the form of money again at the expiration of a few weeks or months.

Of course, permanent assets can be and often are sold, but they usually bring only a fraction of their original cost and their sale represents so drastic a step that it would hardly if ever be undertaken except under the most critical circumstances. From the viewpoint of an operating business, it is perfectly safe to consider fixed tangible assets as permanent investments.

Money invested in plant is money permanently lost in so far as paying bills, meeting pay rolls, purchasing and the general requirements of doing business are concerned.

And it is right here that the danger of over-investment in plant becomes evident. The business man does not appreciate the value of money until he needs it in the form of actual currency for the purpose of saving his business. *1 lot he said it was gone*

It is then he often looks back with vain regret to the thousands of dollars he has overinvested in buildings, land, machinery, delivery equipment, desks, filing cases, and the thou-

sand odd items which go to make up the total of the fixed assets.

Therefore, from the common sense viewpoint, unsupported by statistical facts, it is quite evident that over-investment in plant is a very much more serious ailment than over-investment in either inventories or receivables.

A Serious Symptom.—By a similar method of reasoning, the conclusion is reached that insufficient capitalization is also far more serious.

This is particularly true in the case of the smaller business house. The large ones have access to financial assistance which the smaller organization may not use.

The large corporation, feeling the need of additional capital, will ordinarily find no difficulty in disposing of capital stock, and thus obtain money with which to retire notes, bonds and current liabilities. It may in this way readjust its unbalanced condition.

The smaller organization has no such ready solution. The amount of money it requires is ordinarily not sufficient to attract brokers or investment houses, and unless it can sell its capital stock among its employes, among those from whom it buys goods, or among its customers—a rather long, difficult, and not entirely satisfactory plan—its situation is not readily curable.

Not being well known, the offering of its stock is looked upon with suspicion, and if “fly-by-night” brokers can be secured to market the stock, it is usually at a ruinous rate of commission with no assurances whatever of completing the financing.

About the only real cure for insufficient capitalization in the case of the small corporation is through building up a permanent surplus out of profits.

While this is the best solution, it represents a long drawn out process which seldom appeals to the management, since


it requires the conduct of operations on a moderate scale. This, of course, is entirely out of harmony with the American ideal of making a "killing" quickly.

Analyzing Statements of Bankrupts.—Another rather interesting angle from which to approach the problem would be to analyze balance sheets of bankrupt companies to see what the ratios foretold and how accurately each of them prophesied the coming insolvency.

No definite conclusions could be drawn from any statistical survey of bankrupt companies unless hundreds or even thousands of financial statements were available for analysis, and even then it would be necessary to eliminate the figures of all companies whose failures were due to dishonesty—a rather difficult task in many instances.

Moreover, the findings would not be significant unless a survey were also made of successful concerns to find whether any showed the same symptoms.

The fact that a thousand bankrupt companies showed under-capitalization would be meaningless if it could also be shown that there were a thousand very successful ones that were under-capitalized.

To reach definite conclusions by the study of bankrupts alone would be like trying to prove that the possession of a right hand is the cause of death, based on the fact that nearly all dead men have right hands. 

However, a general, rather than a statistical survey of business, points out that a great majority of failures show symptoms of one or more of the common business ailments, and that a great majority of successful concerns show either no evidence or negligible indications of any of the common business ailments.

With this foreword, it is believed safe to introduce purely for illustrative purposes the statistics of five bankrupt companies. These statistics are, of course, insufficient to prove

anything, but they present certain features that are interesting.

Adjusting Ratio of Quick Assets to Current Liabilities.—

In the accompanying table are the figures from five companies all of which went bankrupt within one year from the date of the last figures:

RATIO OF QUICK ASSETS TO CURRENT LIABILITIES

	Years Prior to Insolvency					
	7	6	5	4	3	2
Company A Ratio....	—	556%	164%	238%	—	125%
Company B Ratio....	—	—	92	79	51%	43
Company C Ratio....	104%	—	88	80	—	78
Company D Ratio....	—	—	91	49	—	58
Company E Ratio....	—	—	—	119	—	59
						42

A certain amount of information is obtainable from this table. From mere inspection it is noted that all companies showed a decreasing ratio of quick assets to current liabilities.

But because of various factors such as geographical location, nature of the business, etc., the ratios are not closely comparable.

For instance, company A shows a high ratio of 556%, while company B shows a high ratio of only 92%. Such a wide range makes interpretation of trends somewhat difficult. For that reason the figures may be shown in a somewhat different form. The highest (not the earliest) ratio for each company may be considered 100% and the remaining ratios for the same company figured in corresponding proportion.

In the case of company A this is accomplished by dividing all the ratios by 556. This makes the first 100%, the second 29%, the third 43%, etc. This leaves them at the same relative value, one to another that they were before.

In order to distinguish the new figures from the actual ratios, they may be called "adjusted ratios." These new figures are shown in the accompanying table:

ADJUSTED RATIO OF QUICK ASSETS TO CURRENT LIABILITIES

		Years Prior to Insolvency					
		7	6	5	4	3	2
Company A:							
Ratios.....	—	556%	164%	238%	—	125%	51%
Adjusted Ratios....	—	100	29	43	—	22	9
Company B:							
Ratios.....	—	—	92	79	51%	43	41
Adjusted Ratios....	—	—	100	86	55	47	45
Company C:							
Ratios.....	104%	—	88	80	—	78	69
Adjusted Ratios....	100	—	85	77	—	75	66
Company D:							
Ratios.....	—	—	91	49	—	58	60
Adjusted Ratios....	—	—	100	54	—	64	66
Company E:							
Ratios.....	—	—	—	119	—	59	42
Adjusted Ratios....	—	—	—	100	—	50	35

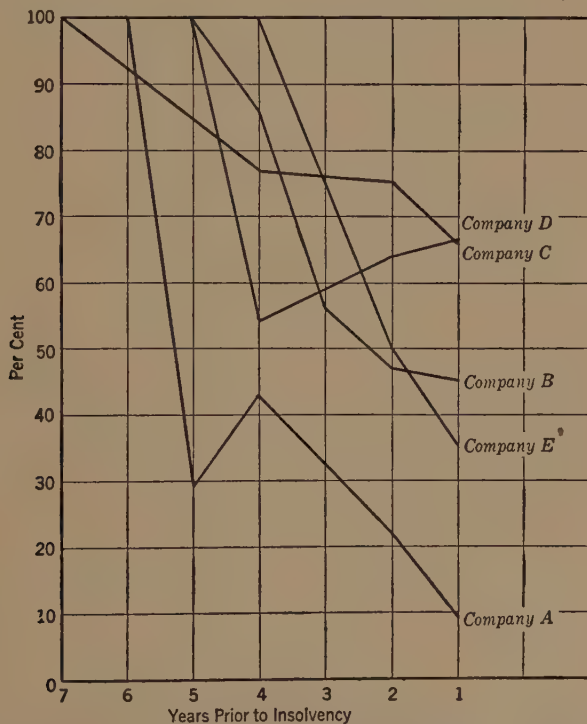


Figure 1. Chart of Adjusted Ratios of Quick Assets to Current Liabilities of Five Bankrupt Companies

The exhibit now becomes more interesting and is even more startling if shown in graphic form as in the chart in Figure 1.

A study of this chart shows that all the companies except company D present a declining ratio of quick assets to current liabilities during the last three years.

Adjusting Current Ratio.—For the same five companies, the ratios of current assets to current liabilities are shown:

RATIO OF CURRENT ASSETS TO CURRENT LIABILITIES							
Years Prior to Insolvency							
	7	6	5	4	3	2	1
Company A:							
Ratios.....	—	960%	238%	543%	—	201%	132%
Adjusted Ratios....	—	100	24	56	—	21	14
Company B:							
Ratios.....	—	—	191	226	258%	153	144
Adjusted Ratios....	—	—	74	88	100	59	56
Company C:							
Ratios.....	139%	—	134	141	—	131	141
Adjusted Ratios....	98	—	95	100	—	93	100
Company D:							
Ratios.....	—	—	234	188	—	169	104
Adjusted Ratios....	—	—	100	80	—	72	44
Company E:							
Ratios.....	—	—	—	370	—	210	111
Adjusted Ratios....	—	—	—	100	—	57	30

When these adjusted ratios are plotted graphically, the chart in Figure 2 results.

In this chart company C does not appear to conform to the trends established by the other companies.

Nevertheless, there appears to be a substantial indication that a declining ratio of current assets to current liabilities was a clear danger signal, although probably not as significant as the former ratio of quick assets to current liabilities.

This, of course, is due to the inclusion of inventories in the calculation. It has already been shown that the inventory

situation may not always represent an influence of primary importance on insolvency.

Adjusting Ratio of Total Debt to Net Worth.—To determine whether a corporation is under-capitalized according to its volume of business is primarily a matter of ascertaining the trend of the ratio between invested capital and loaned capital, i.e., accounts, bills, notes and mortgages payable.

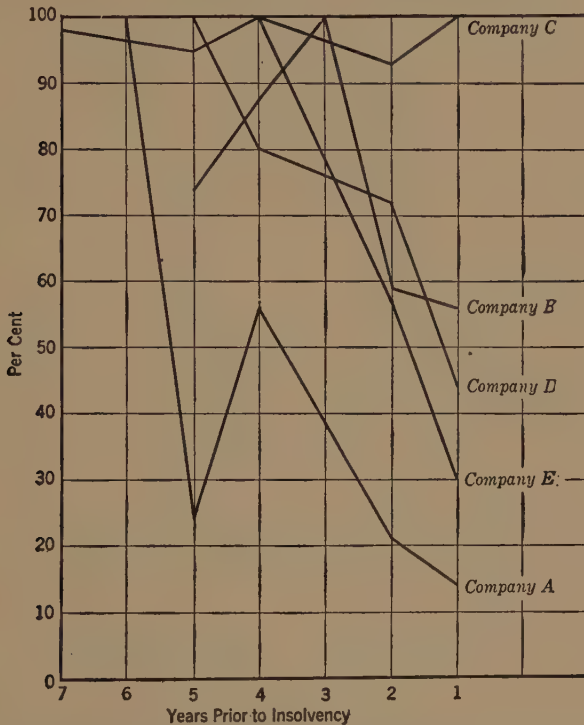


Figure 2. Chart of Adjusted Ratios of Current Assets to Current Liabilities of Five Bankrupt Companies

This ratio is important because invested capital can be retained in a business, whereas loans must be repaid sooner or later. Obviously a decreasing ratio of net worth to total worth from year to year is unfavorable.

Using the same five bankrupt corporations and reducing the ratios to a comparable basis the following table results:

ADJUSTED RATIO OF NET WORTH TO TOTAL DEBT							
Years Prior to Insolvency							
	7	6	5	4	3	2	1
Company A:							
Ratios.....	—	—	385%	910%	—	714%	455%
Adjusted Ratios....	—	—	42	100	—	71	50
Company B:							
Ratios.....	—	—	182	222	263%	176	176
Adjusted Ratios....	—	—	69	46	100	67	67
Company C:							
Ratios.....	110%	—	102	104	—	105	69
Adjusted Ratios....	100	—	93	95	—	96	62
Company D:							
Ratios.....	—	—	270	227	—	185	156
Adjusted Ratios....	—	—	100	84	—	69	58
Company E:							
Ratios.....	—	—	—	588	—	270	124
Adjusted Ratios....	—	—	—	100	—	46	21

Plotting the adjusted ratios graphically, results in the chart shown in Figure 3.

In studying this chart, it is seen that without exception all the companies showed a sharp decrease in the ratio of net worth to total debt for the last two years prior to bankruptcy.

Adjusting Ratio of Net Worth to Fixed Assets.—One of the common financial ailments is over-investment in fixed assets.

Investment in fixed assets should be made in a reasonable proportion to the growth of net worth. When such additional investments in fixed assets are made regularly on borrowed capital, an unbalanced situation arises which may easily lead to bankruptcy.

For this reason the ratio of net worth to fixed assets is an important one. A decrease in this ratio from year to year is, of course, an unfavorable sign. It shows that fixed assets are increasing faster than net worth.

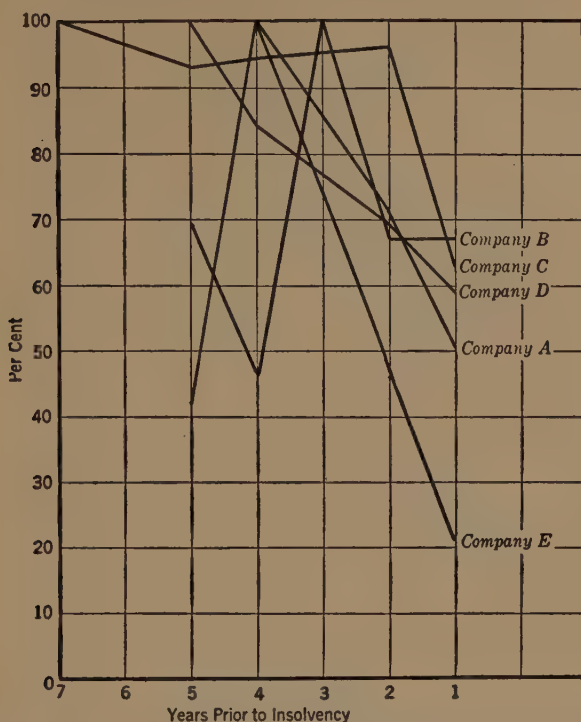


Figure 3. Chart of Adjusted Ratios of Net Worth to Total Debt of Five Bankrupt Companies

Determining this ratio for the five bankrupt companies and reducing to a comparable basis the table on page 108 is obtained.

When these adjusted ratios are charted, they appear as shown in Figure 4. (See page 109.)

The uniformity of trend for all the companies during the three years prior to bankruptcy is particularly noticeable in this chart. The slight upward slant of the line for company C during the last year is hardly sufficient to justify an exception.

Significance of Ratios.—The analysis at the beginning of this chapter indicated that over-investment in fixed assets is a serious business offense and one not easily remedied.

ADJUSTED RATIO OF NET WORTH TO FIXED ASSETS

		Years Prior to Insolvency						
		7	6	5	4	3	2	1
Company A:								
Ratios.....	—	178%	154%	192%	—	107%	101%	
Adjusted Ratios....	—	93	80	100	—	56	53	
Company B:								
Ratios.....	—	—	186	191	184%	134	128	
Adjusted Ratios....	—	—	98	100	97	70	67	
Company C:								
Ratios.....	167%	—	161	175	—	86	105	
Adjusted Ratios....	95	—	92	100	—	49	60	
Company D:								
Ratios.....	—	—	238	170	—	160	102	
Adjusted Ratios....	—	—	100	71	—	67	43	
Company E:								
Ratios.....	—	—	—	215	—	201	110	
Adjusted Ratios....	—	—	—	100	—	93	51	

Apparently the common sense analysis and this brief statistical survey agree.

Certainly there is evidence which points toward the statement that of the common business ailments discussed in this chapter, two are moderately serious and two are dangerous.

The moderately serious ones are:

1. Over-investment in receivables.
2. Over-investment in inventories.

The dangerous ones are:

1. Insufficient capitalization.
2. Over-investment in fixed assets.

It seems almost obvious that with this knowledge of the relative importance of business ailments the analyst will be able to perform his diagnosis with greater shrewdness and greater sense of security in his conclusions.

Those readers whose work as credit men, bankers or investigators puts them into daily contact with balance sheets of corporations, will find their use of balance sheet ratios a source of much greater satisfaction when they approach each situa-

tion not only from the viewpoint of analyzing for the common ailments of business, but also give to each its proper emphasis.

Public accountants will find their analysis service much sounder when approached from the viewpoint set forth in this

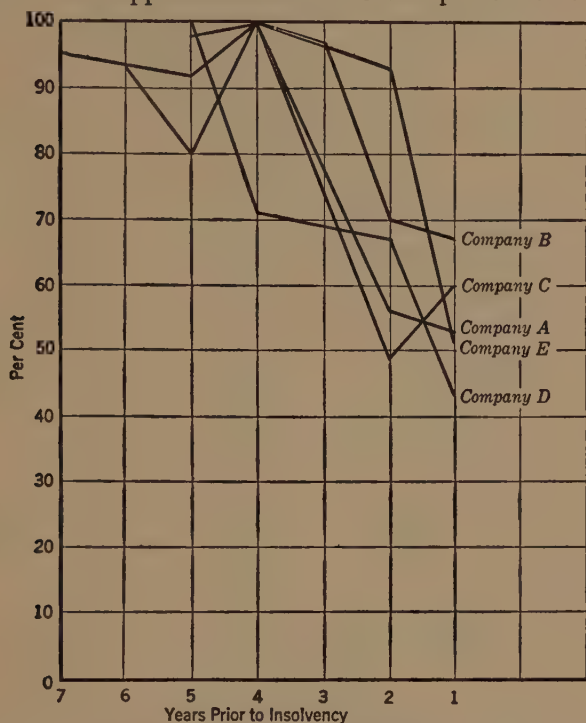


Figure 4. Chart of Adjusted Ratios of Net Worth to Fixed Assets for Five Bankrupt Companies

chapter. It will afford them a basis for constructive business counsel that should win enthusiastic clients.

He who constantly watches the affairs of one company, whether as its comptroller or chief executive, will find his analysis of monthly statements more profitable when approached from the viewpoint of the common ailments and their relative importance. Such an analysis forces him to take a bird's-eye view—a salutary thing for one who as the result of his customary activities is immersed in details.

CHAPTER XI

HISTORICAL ANALYSIS OF BALANCE SHEETS— TREND METHOD

Theory of Balance Sheet Analysis.—In studying technique and methods it is wise not to overlook the purpose of balance sheet analysis.

As already stated, its purpose is to bring to light information which the balance sheet figures themselves do not clearly reveal.

Just as the doctor's diagnosis develops facts which would not be apparent even to his skilled eye through mere observation, so does balance sheet analysis shed light on hidden business symptoms which mere inspection of the actual figures would not discover.

The theory of balance sheet analysis assumes that the financial condition of every business is constantly changing for better or worse.

Distortion of financial position means that the various classes of balance sheet items are out of their proper relation with one another. It is to show such distortion that the balance sheet reader makes his analysis.

From this viewpoint, therefore, the problem is not one of studying the actual amounts appearing on the balance sheet, but rather one of determining relationships between the various classes of items composing the statement.

It is upon this theory that previous chapters have been based. A number of relationships or ratios have been worked out. These ratios are constructed from successive balance sheets of the same company and are then compared to see if any definite trends are to be found.

Balance Sheet Ratios.—The ratio method of balance sheet analysis undoubtedly was started by the old time banker and credit man to whom the beginning and end of balance sheet analysis was to compare the current liabilities with the current assets.

Just as the alleged trail made by the wabbling calf later became well beaten and turned into a road, and finally into the most crooked street of Boston, so was the "current ratio" of the old time credit man responsible for the present ratio method of balance sheet analysis.

Objections to the Ratio Method.—There are certain strong objections to the ratio method of balance sheet analysis.

These are as follows :

1. Any balance sheet ratio represents a relationship between two varying factors and any change in a ratio from one year to another must be interpreted by the examination of the changes in the two items from which the ratio is built.
2. The ratio is so artificial a figure that it is difficult for the analyst to keep in mind its connection with the actual balance sheet under survey.
3. The ratios give an unwarranted impression of finality, whereas the different ratios probably vary in their reliability.
4. In studying balance sheets by the ratio method it is difficult to obtain a bird's-eye view of the relation of various elements to one another.

The first objection has already been discussed. If the current assets of a company in one year amount to \$10,000 and the current liabilities are \$5,000, the ratio is 200%. If the next year current assets remain at \$10,000 and the current liabilities fall to \$2,500, the ratio is 400%.

But the ratio is also 400% if the liabilities remain at \$5,000 and the current assets increase to \$20,000. This means that

the ratio method of analysis requires a continual comparison back and forth between the ratios and the actual balance sheet figures.

It is also partly responsible for the fact that it requires at least two ratios to diagnose properly each of the common business ailments.

Ratios are Artificial.—An even more important objection is the second one.

The reader has probably experienced the feeling that ratios are rather artificial figures. Working with ratios imposes a mental strain. It is hard to keep in mind the connection between the ratios and the balance sheet from which they are constructed.

Reliability of Ratios.—Also there appears to be quite a difference between the reliability of the different ratios. Some seem to be fairly sure indicators, others not. Those working with ratios will always have to be on guard against forming too positive conclusions.

Analysis and Common Sense.—Balance sheet analysis requires the use of a good deal of common sense.

It is somewhat difficult to exercise the required amount of common sense in analyzing balance sheets by the ratio method because the ratio method splits the problem into different parts and it is easy to lose the bird's-eye view of the entire balance sheet situation.

Such a bird's-eye view is essential if common sense is to be exercised.

Trend or Percentage Method of Analysis.—Because of these various objections to the ratio method, another method, which may be called the trend percentage method, has been devised to take the place of the ratio method in so far as the determination of trends is concerned.

The method is simple. It first involves grouping the various items of assets and liabilities for the various years into classes such as:

1. Quick assets. (This should usually be sub-divided to show receivables separately.)
2. Inventories.
3. Current assets.
4. Fixed assets.
5. Current liabilities.
6. Long-time liabilities.
7. Net worth.

The next step is to divide the totals of each class for each year by the total of the first class (in point of time).

This converts all of the actual group total figures into percentages of the first.

In order to show just how this method works out, the original balance sheet figures of the Ames Manufacturing Company are repeated here:

THE AMES MANUFACTURING COMPANY
COMPARATIVE BALANCE SHEET

As of December 31

<i>Assets</i>	1921	1922	1923	1924
Cash.....	\$ 4,652	\$13,371	\$ 7,190	\$10,512
Accounts Receivable (Net).....	14,468	8,217	5,629	5,857
Total Quick Assets.....	\$19,120	\$21,588	\$12,819	\$16,369
Inventories.....	17,556	20,607	28,077	22,210
Total Current Assets.....	\$36,676	\$42,195	\$40,896	\$38,579
Fixed Assets (less Depreciation) ..	17,922	25,707	36,163	37,290
Prepaid Expense.....	76	213	2,545	2,459
Total Assets.....	<u>\$54,674</u>	<u>\$68,115</u>	<u>\$79,604</u>	<u>\$78,328</u>
<i>Liabilities and Capital</i>				
Notes Payable—Trade.....	\$ 1,000	\$ —	\$ 3,000	\$ 1,000
Notes Payable—Bank.....	4,000	4,000	3,000	2,000
Accounts Payable.....	7,000	4,000	8,000	5,000
Dividends Payable.....	2,000	—	2,000	2,000
Accrued Liabilities.....	128	690	337	248
Current (and Total) Liabilities.	<u>\$14,128</u>	<u>\$ 8,690</u>	<u>\$16,337</u>	<u>\$10,248</u>

Capital Stock Outstanding.....	\$50,000	\$50,000	\$50,000	\$50,000
Surplus (or * Deficit).....	* 9,454	9,425	13,267	18,080
Total Net Worth.....	<u>\$40,546</u>	<u>\$59,425</u>	<u>\$63,267</u>	<u>\$68,080</u>
Total Liabilities and Net Worth..	<u>\$54,674</u>	<u>\$68,115</u>	<u>\$79,604</u>	<u>\$78,328</u>
Sales.....	<u>\$52,088</u>	<u>\$66,383</u>	<u>\$90,652</u>	<u>\$96,691</u>

Analyzing the above by the ratio method the following figures result:

Ratios	1921	1922	1923	1924
Quick assets to current liabilities...	$\frac{\$19,120}{\$14,128} = 135\%$	$\frac{\$21,588}{\$8,690} = 248\%$	$\frac{\$12,819}{\$16,337} = 78\%$	$\frac{\$16,369}{\$10,248} = 160\%$
Current assets to current liabilities	$\frac{\$36,676}{\$14,128} = 260\%$	$\frac{\$42,195}{\$8,690} = 486\%$	$\frac{\$40,896}{\$16,337} = 250\%$	$\frac{\$38,579}{\$10,248} = 376\%$
Sales to receivables	$\frac{\$52,088}{\$14,468} = 360\%$	$\frac{\$66,383}{\$8,217} = 808\%$	$\frac{\$90,652}{\$5,629} = 1610\%$	$\frac{\$96,691}{\$5,857} = 1650\%$
Sales to inventory..	$\frac{\$52,088}{\$17,556} = 297\%$	$\frac{\$66,383}{\$20,607} = 322\%$	$\frac{\$90,652}{\$28,077} = 323\%$	$\frac{\$96,691}{\$22,210} = 435\%$
Sales to net worth	$\frac{\$52,088}{\$40,546} = 128\%$	$\frac{\$66,383}{\$59,425} = 112\%$	$\frac{\$90,652}{\$63,267} = 143\%$	$\frac{\$96,691}{\$68,080} = 142\%$
Net worth to fixed assets.....	$\frac{\$40,546}{\$17,922} = 226\%$	$\frac{\$59,425}{\$25,707} = 231\%$	$\frac{\$63,267}{\$36,163} = 175\%$	$\frac{\$68,080}{\$37,290} = 182\%$
Net worth to liabilities.....	$\frac{\$40,546}{\$14,128} = 287\%$	$\frac{\$59,425}{\$8,690} = 684\%$	$\frac{\$63,267}{\$16,337} = 387\%$	$\frac{\$68,080}{\$10,248} = 664\%$
Sales to fixed assets	$\frac{\$52,088}{\$17,922} = 290\%$	$\frac{\$66,383}{\$25,707} = 258\%$	$\frac{\$90,652}{\$36,163} = 251\%$	$\frac{\$96,691}{\$37,290} = 259\%$

Certain definite conclusions regarding the trend of affairs with the Ames Manufacturing Company can be reached by studying the above tabulation, but the same conclusions can be reached more easily, quickly, and certainly by a glance at the following:

THE AMES MANUFACTURING COMPANY
COMPARATIVE BALANCE SHEET
As of December 31

(Percentage based on 1921 figures.)

	1921	1921	1922	1923	1924
	Amount	Percent- age of 1921	Percent- age of 1921	Percent- age of 1921	Percent- age of 1921
<i>Assets</i>					
Accounts Receivable.....	\$14,468	100	56	39	40
Quick Assets.....	19,120	100	113	67	86
Inventories.....	17,556	100	117	160	127
Current Assets.....	36,676	100	115	112	105
Fixed Assets.....	17,922	100	143	202	208
Prepaid Expense (omitted)					

Liabilities and Capital

Current Liabilities (also to- tal).....	\$14,128	100	62	116	73
Net Worth.....	40,546	100	147	156	168
Sales.....	52,088	100	127	174	186

Interpreting the Percentage Statement.—A rather serious study of ratios requiring considerable time will finally tell that the only one noteworthy symptom is the disproportionate increase in fixed assets.

The percentage statement tells the same story, but it tells it far more quickly and vividly.

By inspection only it is possible to compare the increase or decrease of each of the various factors with any of the others. If it is desired to compare fixed assets with sales, a mere glance will show that the fixed assets have increased to 208%, where sales have increased to only 186%.

This furnishes just as much information as is given by the ratio of sales to fixed assets which dropped from 290% in 1921 to 259% in 1924.

But there is an additional advantage. At the same time that the increase of fixed assets is compared with the sales, it is also possible to compare the increase in fixed assets with other items in the balance sheet. For example, fixed assets may be compared with net worth which has increased to 168%. That the fixed assets have increased faster than the net worth is immediately apparent, and the belief that the fixed assets have increased somewhat too rapidly is confirmed.

These conclusions are formed by mere inspection of all the percentage figures. The conclusions are much more certain to be supported at all times by common sense, since all of the trends are surveyed at one time.

In attempting to diagnose the common business ailments, this method is just as effective as the ratio method, if not more so.

Illustrations of Trend Method.—As further evidence of the value of this trend method, examine the following comparative balance sheet and the accompanying analysis :

STEEL PRODUCTS COMPANY
COMPARATIVE BALANCE SHEET
As of the Dates Shown

	Dec. 31, 1916	Dec. 31, 1917	Dec. 31, 1919	Sept. 28, 1920
<i>Assets</i>				
Cash.....	\$ 18,565	\$ 13,717	\$ 52,178	\$ 445
Notes and Accounts Receivable.....	176,551	175,536	239,123	271,517
Current Assets.....	\$195,116	\$ 189,253	\$ 291,301	\$ 271,962
Inventories.....	307,965	535,684	548,379	198,094
Current and Working Assets.....	\$503,081	\$ 724,937	\$ 839,680	\$ 470,056
Fixed Assets.....	292,955	544,605	574,066	693,264
Total Assets.....	<u>\$796,036</u>	<u>\$1,269,542</u>	<u>\$1,413,746</u>	<u>\$1,163,320</u>
<i>Liabilities and Capital</i>				
Current Liabilities.....	\$215,386	\$ 386,218	\$ 497,856	\$ 452,810
Net Worth.....	580,650	883,324	915,890	710,510
Total.....	<u>\$796,036</u>	<u>\$1,269,542</u>	<u>\$1,413,746</u>	<u>\$1,163,320</u>

STEEL PRODUCTS COMPANY
COMPARATIVE BALANCE SHEET
As of the Dates Shown

(Based on percentage of 1916 figures.)

	Dec. 31, 1916	1917	1919	1920
<i>Assets</i>	Amount	Percentage of 1916	Percentage of 1916	Percentage of 1916
Receivables.....	\$176,551	99	135	154
Quick Assets.....	195,116	97	149	139
Inventories.....	307,965	174	178	64
Current Assets.....	503,081	144	167	93
Fixed Assets.....	292,955	186	196	236
<i>Liabilities and Capital</i>				
Current Liabilities.....	\$215,386	179	231	210
Net Worth.....	580,650	152	158	122

The increase to 210% in current liabilities as compared with only 122% in net worth is a danger signal, showing that the company is financing itself more through its creditors.

The decrease in current assets to 93% and the increase of fixed assets to 236% show a decidedly unfavorable trend.

As a matter of fact the company (the name is fictitious) became insolvent shortly after the date of the last balance sheet.

Applying the trend method to another set of balance sheets, the following appears :

WIRE AND IRON COMPANY
COMPARATIVE BALANCE SHEET
As of December 31

<i>Assets</i>	1922	1923	1924
Cash.....	\$ 6,040	\$ 6,375	\$ 95
Accounts Receivable (Net).....	38,500	41,385	43,920
Current Assets.....	\$ 44,540	\$ 47,760	\$ 44,015
Inventories.....	94,425	122,825	72,800
Current and Working Assets....	\$138,965	\$170,585	\$116,815
Fixed Assets.....	113,600	127,200	117,500
Total Assets.....	<u>\$252,565</u>	<u>\$297,785</u>	<u>\$234,315</u>
<i>Liabilities and Capital.</i>			
Current Liabilities.....	\$ 37,564	\$ 80,704	\$104,924
Net Worth.....	215,001	217,081	129,391
Total.....	<u>\$252,565</u>	<u>\$297,785</u>	<u>\$234,315</u>

WIRE AND IRON COMPANY
COMPARATIVE BALANCE SHEET
As of December 31

(Trend percentages based on 1922 figures.)

<i>Assets</i>	1922 Amount	1923 Percentage of 1922	1924 Percentage of 1922
Receivables.....	\$ 38,500	107	114
Quick Assets.....	44,540	107	99
Inventories.....	94,425	130	77
Current Assets.....	138,965	123	84
Fixed Assets.....	113,600	112	103
<i>Liabilities and Capital</i>			
Current Liabilities.....	\$ 37,564	215	279
Net Worth.....	215,001	101	60

These figures tell a story of a desperate attempt to finance a losing venture. Shortly after the date of the last balance sheet, this company became bankrupt.

Another interesting set of figures is as follows:

ORNAMENTAL IRON WORKS
COMPARATIVE BALANCE SHEET
As of Dates Shown

<i>Assets</i>	Jan. 1, 1908	Jan. 1, 1910	Dec. 31, 1910	Mar. 11, 1912	Jan. 1, 1913
Cash.....	\$ 7,588	\$ 5,604	\$ 6,069	\$ 450	\$ 7,028
Receivables.....	244,687	217,712	205,347	203,872	381,279
Quick Assets.....	\$252,275	\$223,316	\$211,416	\$204,322	\$ 388,307
Inventories.....	82,727	113,298	162,322	141,691	408,368
Current Assets.....	\$335,002	\$336,614	\$373,738	\$346,013	\$ 796,675
Fixed Assets.....	169,669	172,354	166,140	523,355	581,165
Total Assets.....	<u>\$504,671</u>	<u>\$508,968</u>	<u>\$539,878</u>	<u>\$869,368</u>	<u>\$1,377,840</u>
<i>Liabilities and Capital</i>					
Current Liabilities.....	\$240,362	\$252,068	\$265,018	\$263,968	\$ 563,783
Mortgage Liabilities.....	—	—	—	160,000	250,000
Total Liabilities.....	\$240,362	\$252,068	\$265,018	\$423,968	\$ 813,783
Net Worth.....	264,309	256,900	274,860	445,400	564,057
Total.....	<u>\$504,671</u>	<u>\$508,968</u>	<u>\$539,878</u>	<u>\$869,368</u>	<u>\$1,377,840</u>

ORNAMENTAL IRON WORKS
COMPARATIVE BALANCE SHEET
As of Dates Shown

(Trend percentages based on 1908 figures.)

<i>Assets</i>	Jan. 1, 1908 Amount	1910 Percent- age of 1908	1911 Percent- age of 1908	1912 Percent- age of 1908	1913 Percent- age of 1908
Receivables.....	\$244,687	89	84	83	156
Quick Assets.....	252,275	89	84	81	154
Inventories.....	82,727	137	196	171	494
Current Assets.....	335,002	100	112	103	238
Fixed Assets.....	169,669	102	98	308	343
<i>Liabilities and Capital</i>					
Current Liabilities.....	\$240,362	105	110	110	234
Total Liabilities.....	240,362	105	110	176	339
Net Worth.....	264,309	97	104	169	213

What conclusions can be drawn from this analysis?

Not having the sales figures available, it is a little difficult to extract the full meaning from the figures, but it is significant that the inventories have increased to 494%, while the quick assets have increased only to 154%, and net worth to only 213%. There is a strong indication of too much money being tied up in inventories.

An increase in fixed assets to 342% as compared to the increase in net worth to 213%, also shows a trend toward over-investment in fixed assets.

The increase of current liabilities to 234% as compared with the increase of quick assets to only 154% and the increase of net worth to only 213%, is a bad indication. The company is apparently financing itself too much through its creditors and not enough through permanent investment.

Everything considered, the company seems to be in a badly

BRIDGE AND STEEL WORKS
COMPARATIVE BALANCE SHEET
As of the Dates Shown

	May 31, 1908	Aug. 31, 1909	Jan. 31, 1911
<i>Assets</i>			
Cash.....	\$ 35,368	\$ 205,371	\$ 227,482
Accounts Receivable (Net).....	333,809	88,721	260,813
Quick Assets.....	\$369,177	\$ 294,092	\$ 488,295
Inventories.....	33,301	192,822	96,269
Uncompleted Contracts, etc.....	189,936	272,737	515,240
Current Assets.....	\$592,414	\$ 759,651	\$1,099,804
Real Estate and Plant.....	322,902	1,256,400	1,742,769
Total Assets.....	<u>\$915,316</u>	<u>\$2,016,051</u>	<u>\$2,842,573</u>
<i>Liabilities and Capital</i>			
Current Liabilities.....	\$294,839	\$ 573,292	\$1,031,494
Mortgage.....	4,500	150,000	400,000
Deferred Liabilities.....	98,215	33,355	29,860
Total Liabilities.....	\$397,554	\$ 756,647	\$1,461,354
Capital and Surplus (less Goodwill)	517,762	1,259,404	1,381,219
Total.....	<u>\$915,316</u>	<u>\$2,016,051</u>	<u>\$2,842,573</u>

distorted financial position, and it would not be far wrong to anticipate financial difficulties. As a matter of fact the Ornamental Iron Works did go into receivership in the year 1913.

This case offers a good example of how a company can be making money (as indicated by the increase in net worth) and still become insolvent through improperly distributing the proceeds of its profits.

The figures for the Bridge and Steel Works on page 119 and below tell a similar story:

BRIDGE AND STEEL WORKS
COMPARATIVE BALANCE SHEET
As of the Dates Shown
(Based on percentage of 1908 figures.)

	May 31, 1908 Amount	1909 Percentage of 1908	1911 Percentage of 1908
<i>Assets</i>			
Accounts Receivable.....	\$333,809	27	78
Quick Assets.....	369,177	80	132
Inventories.....	33,301	579	289
Uncompleted Contracts.....	189,936	144	271
Current Assets.....	592,414	128	186
Fixed Assets.....	322,902	389	540
<i>Liabilities and Capital</i>			
Current Liabilities.....	\$294,839	194	350
Long-Time Liabilities.....	102,715	179	418
Total Liabilities.....	397,554	190	368
Net Worth.....	517,762	243	267

A marked tendency toward over-investment in fixed assets is clearly indicated in these figures.

The heavy increase in liabilities as compared with net worth shows an improper financing policy. The decrease in quick assets and the small increase in current assets as compared with the other classes of items on the balance sheet indicate an approaching bad credit position.

Receivership of this company actually resulted in 1911.

Comparison of the Two Methods.—In conclusion, it should be noted that both the ratio method and the trend method of analysis tell the same story. But the trend method tells the story quickly and by mere inspection, while the ratio method tells it in an involved way, which requires study to obtain the facts.

The trend method of balance sheet analysis has advantages over the ratio method as follows:

1. It furnishes a bird's-eye view of the problem.
2. The facts are presented in comparative form.
3. The trends are shown vividly.
4. The figures are easier to interpret.
5. Less highly trained help is required to work out the figures for analysis, and the calculations can be made much more quickly.
6. There is less liability for gross error because the resulting percentages are partially self-auditing through comparison with the actual figures.

This method has none of the disadvantages and has every advantage of the ratio method so far as the analysis of the trends of successive balance sheets of the same company is concerned. It also has some further advantages as will be seen in the next chapter.

Explaining Analysis Method to Others.—This method is much easier to explain to a client or general executive than the ratio method. Sometimes such explanation is necessary, although not often desirable.

It is usually not desirable, because the explanation of either method is confusing to the non-technical person. Either one of them should be used simply as a working tool to help form conclusions.

There is usually no necessity to explain just exactly the ways and means by which those conclusions were reached. Further discussion of this point will be found in Chapter XVII.

The first hasty objection to this trend method might have to do with the selection of the basic year, i.e., in the last example, the year 1908. The claim might be made that it is not a normal or typical year.

This, however, is not a valid objection since the method does not pretend to show variations from normal, but rather to show the trend of changes, and for this purpose the figures of any previous year may be taken to represent 100%.

As a matter of fact it is doubtful whether there is a "normal year" in any industry. A bulletin of the National Bureau of Economic Research says, "No year is, strictly speaking, a normal year."

CHAPTER XII

HISTORICAL ANALYSIS OF BALANCE SHEETS— TREND METHOD—(Continued)

Two Advantages of Trend Method.—The credit man who has been using ratios in his analysis work will welcome the trend method for two important reasons:

1. By the addition of narrow columns to the printed form he regularly uses for comparative balance sheets, he can show the balance sheet figures and the trend percentages on the one form.
2. The calculations by the trend method require considerably less time and less highly trained help than calculations by the ratio method.

These two advantages are more important in credit departments than elsewhere because of the large volume of analytical work to be done. The executive, accountant, or investor does not usually analyze a great number of statements currently.

With the ratio method the credit man requires either a lengthy cumbersome form, the upper portion providing for the comparative balance sheet figures and the lower for the ratio calculations, or else two forms requiring reference back and forth from one to the other.

By adding narrow columns for the trend percentages to his regular comparative statement form, the credit man secures a compact analytical exhibit which is easier to prepare, use, and interpret accurately.

The second advantage is also important. In the credit departments of large manufacturing and wholesale organizations there is a constant stream of new statements. Each must be transferred to a comparative statement form, which is usually

the first page of each customer's credit file. They are then analyzed and conclusions are drawn.

If the calculations for this analysis can be done more quickly and by cheaper help, it will release higher class assistants for more difficult work.

The trend method is quicker than the ratio method because :

1. The divisor is constant in finding the trend percentages of any given row of balance sheet items, whereas the divisor changes as many times as there are years in the comparative balance sheet in the case of any given ratio. This constant divisor shortens the operation greatly when calculating with a slide rule.
2. The trend method involves fewer calculations than the ratio method to get the same information. In Chapter XI the balance sheets of the Ames Manufacturing Company were analyzed by both methods. The ratio method required 32 separate calculations while the trend method required only 24, or 25% less.

Trend Method More Flexible.—Also, the trend method possesses greater flexibility for all classes of users.

It works well with unusual balance sheets of non-trading companies, where the standard ratios do not seem to be entirely adequate or appropriate, or give false impressions. Railroad companies, banks, public utilities, etc., fall in this class.

The following condensed balance sheets are of a street railway company.

The balance sheets themselves are not noteworthy and are shown only to illustrate the application of the trend method to this type of statement.

The most noticeable feature of this statement is the small amount of current assets as compared to the current liabilities.

The nature of the business requires practically no receivables, while the inventory is a minor factor, consisting not of merchandise for resale but of materials and supplies for the company's own use.

STREET RAILWAY COMPANY
COMPARATIVE BALANCE SHEET
As of December 31

<i>Assets</i>	1921		1922		1923	
	Amount	% of 1921	Amount	% of 1921	Amount	% of 1921
Cash.....	\$ 11,318	—	\$ 11,301	—	\$ 9,877	—
Receivables.....	3,685	—	1,175	—	1,241	—
Quick Assets.....	\$ 15,003	100	\$ 12,476	83	\$ 11,118	74
Inventories.....	23,186	100	22,294	96	20,952	90
Current Assets.....	\$ 38,189	100	\$ 34,770	91	\$ 32,070	84
Special Funds.....	34,500	—	32,430	—	93,002	—
Property and Plant.....	1,596,796	100	1,599,680	100	1,633,855	102
Deferred Charges.....	85,874	—	79,237	—	84,524	—
Total.....	<u>\$1,755,359</u>	—	<u>\$1,746,117</u>	—	<u>\$1,843,451</u>	—
<i>Liabilities and Net Worth</i>						
Accounts Payable.....	\$ 107,431	—	\$ 130,208	—	\$ 62,973	—
Due City.....	17,981	—	5,982	—	—	—
Due Stockholders.....	—	—	—	—	48,426	—
Current Liabilities.....	\$ 125,412	100	\$ 136,190	109	\$ 111,399	89
Unredeemed Tickets.....	2,915	—	3,616	—	4,595	—
Equipment and Other Notes.....	200,000	—	178,766	—	173,000	—
Bonds.....	877,500	100	877,500	100	917,500	105
Total Liabilities.....	<u>\$1,205,827</u>	100	<u>\$1,196,072</u>	99	<u>\$1,206,494</u>	100
Capital Stock.....	\$ 394,200	—	\$ 436,416	—	\$ 478,900	—
Surplus.....	155,332	—	113,630	—	158,057	—
Total Net Worth.....	<u>\$ 549,532</u>	100	<u>\$ 550,045</u>	100	<u>\$ 636,957</u>	116
Total.....	<u>\$1,755,359</u>	—	<u>\$1,746,117</u>	—	<u>\$1,843,451</u>	—
Gross Earnings.....	\$ 411,697	100	\$ 419,462	102	\$ 417,602	101

Testing the statement for each of the common business ailments, the following conclusions are reached:

Over-investment in inventory..... Trend O.K.
Over-investment in receivables..... " "
Over-investment in plant..... " "
Insufficient capitalization..... " "

The credit position is, of course, bad from the viewpoint of a trading concern, since the current assets are inadequate to meet the current liabilities.

This series of balance sheets shows another application of the trend method which is of some interest to the investor in bonds.

The fixed assets increased to 102%, while the bonded debt

increased to 105%. This, of course, is unimportant, but since instances have been known of over-bonding, to the investor's detriment, this particular examination of trends is one well worth making before purchasing bonds.

The point is well illustrated by the following figures taken from the balance sheets of a well known public utility company :

Year	Plant	Trend	Bonds	Trend
		%		%
1919.....	\$1,703,000	100	\$ 604,600	100
1920.....	1,811,000	106	736,000	122
1921.....	2,121,000	125	923,000	153
1922.....	2,174,000	128	923,000	153
1923.....	2,508,000	147	1,281,000	212

There is obviously a steady tendency toward over-bonding that might not be detected from a mere inspection of the figures or from a calculation of the customary ratios.

It should not be inferred that the company is actually over-bonded in 1923. There still appears to be an ample margin of safety, but the trend toward over-bonding is evident and the investor is put on guard accordingly. A bond of this company bought in 1919 may be less adequately protected in 1923, and to that extent, other things being equal, may be less valuable.

Trend of Operating Statistics.—Excellent use may be made of the trend method when, as frequently happens with the published statements of non-trading companies, certain operating statistics are available.

The following figures are taken from the annual reports of a large gas company (unimportant items being omitted) :

Statistics	1920		1921		1922		1923	
	Amount	% of 1920	Amount	% of 1920	Amount	% of 1920	Amount	% of 1920
Miles of Mains...	\$ 1,007	100	\$ 1,274	127	\$ 1,551	154	\$ 1,906	189
Number of Consumers.....	56,500	100	70,752	125	87,374	155	121,618	215
Output (M cu. ft.)	7,383,498	100	9,546,925	129	17,113,529	232	25,405,140	344

<i>Assets</i>									
Quick.....	\$ 527,202	100	\$ 726,789	138	\$ 1,274,890	242	\$ 1,199,029	227	
Inventories.....	501,984	100	398,211	79	592,267	118	755,869	151	
Current.....	\$ 1,029,186	100	\$ 1,125,000	109	\$ 1,867,157	181	\$ 1,954,898	190	
Fixed.....	\$13,074,767	100	\$15,737,635	120	\$18,348,509	140	\$22,822,804	175	
<i>Liabilities and Capital</i>									
Current Liabilities	\$ 1,477,706	100	\$ 1,157,308	78	\$ 1,606,331	109	\$ 2,435,317	165	
Bonds.....	4,596,000	100	7,378,000	161	9,344,000	203	11,825,000	257	
Total Liabilities	\$ 6,073,706	100	\$ 8,535,308	141	\$10,950,331	180	\$14,260,317	235	
Net Worth.....	\$ 7,668,319	100	\$ 8,029,394	105	\$ 8,363,864	109	\$ 9,361,858	122	
Sales.....	\$ 3,110,311	100	\$ 4,268,335	137	\$ 5,739,154	185	\$ 7,349,607	236	

A study of the trend of the statistics illuminates the balance sheet trends.

The increases in the trend of "number of mains," "number of consumers" and "output" all compare favorably with the trend of the plant investment, and serve to confirm the conclusion that the company is not over-investing in plant.

A rather marked tendency toward under-capitalization is evident, the total liabilities having increased to 235% as compared with an increase in net worth to only 122%.

The trends of the statistics show rapid growth in 1922 and 1923. This sudden expansion was undoubtedly responsible for the character of the financing.

The most obvious and practical remedy would be to sell stock, preferably to the company's customers, and use the proceeds to reduce current indebtedness. As a matter of fact this plan was actually adopted in 1923, but the effect on the 1923 balance sheet of this financing, the cash returns from which were undoubtedly on the instalment basis, was slight.

There is also a marked tendency toward over-bonding. The fixed assets increased to 175% as compared with an increase in bonded indebtedness to 258%. There is, however, no indication that a dangerous condition of over-bonding has yet been reached.

The general conclusions from the analysis appear as follows:

Over-investment in inventory	Trend O.K.
Over-investment in receivables	Trend O.K.
(Receivables were not shown separately on the balance sheet, being an unimportant factor in this kind of business.)	
Over-investment in plant	Trend O.K.
Insufficient capital	Unfavorable trend

Special Business Problems.—The trend method possesses a flexibility that enables it to be used effectively, not only in studying the complete balance sheet figures, but also in studying special problems peculiar to certain types of business, as, for example, over-bonding by public utilities.

Also, a tendency toward insufficiency of depreciation provisions may be developed, in special cases, by studying the percentages showing trends of fixed assets and depreciation reserves (valuation accounts).

And finally, the trend method readily permits the inclusion of other factors, such as operating statistics, whereas the ratio method is awkward when dealing with more than two factors.

In some instances this may be important. In analyzing the statement of an automobile parts company, the inclusion of trend percentages of the volume of business of one or more automobile manufacturers might be illuminating.

Trend of Sales Volumes.—The following calendar year figures were taken from the balance sheets of a corporation making an important item of equipment for automobiles and sold to the manufacturers thereof.

Refinancing operations in 1922, whereby the bond issue was created, also involved the sale of \$750,000 of preferred stock. This accounts in large part for the increase in "Net Worth (a)."

The actual trend of net worth as nearly as can be determined by eliminating the \$750,000 item is shown as "Net Worth (b)." This trend is the significant one from the operating viewpoint.

Assets	1921		1922		1923	
	Amount	% of 1921	Amount	% of 1921	Amount	% of 1921
Quick Assets.....	\$ 314,386	100	\$ 473,936	150	\$ 402,045	128
Inventories.....	1,737,996	100	1,542,862	89	1,762,032	101
Current Assets.....	\$ 2,052,382	100	\$ 2,016,798	98	\$ 2,164,077	105
Fixed Assets.....	1,354,860	100	1,461,551	108	1,847,260	136
<i>Liabilities and Capital</i>						
Current Liabilities.....	\$ 2,297,761	100	\$ 792,829	35	\$ 1,110,248	48
Long-Time Liabilities.....	none		1,000,000		1,000,000	
Total Liabilities.....	\$ 2,297,761	100	\$ 1,792,829	78	\$ 2,110,248	92
Net Worth (a).....	1,525,390	100	2,306,497	150	2,456,581	161
Net Worth (b).....	1,525,390	100	1,556,497	102	1,706,581	112
Sales of This Company.....	1,852,836	100	2,947,873	159	3,778,910	204
Sales of Automobile Manufacturing Co.....	96,690,644	100	133,178,881	138	166,153,683	172

The inclusion of the sales figures of the automobile parts manufacturer gives an indication of general trends in the industry, and helps in forming a judgment as to the sufficiency of the sales of the company under analysis. This matter is more completely discussed in Chapter XVI.

Trends Only Shown by Trend Method.—The suggestion has been made that the trend method and the ratio method are not two different ways of accomplishing identically the same thing, but rather that they supplement one another.

There is a certain amount of truth in this contention. Any value which the ratio method may have in analyzing a single balance sheet is also of value in supplementing the trend method of analyzing a series of balance sheets.

Only in so far as the ratio method is used to show trends is it found a cumbersome instrument which can be replaced more effectively by the trend percentage method.

In other words, the trend percentage method shows trends—and nothing but trends.

The ratio method shows the interrelationship of the various elements in a single balance sheet, and when the ratios for several single balance sheets are considered together, they shed some light on the trends but they represent a clumsy instrument for this purpose.

Trends vs. Condition.—It is perfectly obvious that a company may show very bad trends and still be in good condition.

Thus in the gas company figures shown on a preceding page, it was shown that fixed assets showed an increase to 175% and bonded indebtedness an increase to 258%. It was explained that this was a bad trend, but that it did not signify that a dangerous point had yet been reached.

As a matter of fact, even at the end of 1923 there was approximately \$2 of fixed assets for every dollar of bonds. Here is an illustration of using the ratio method to supplement the trend study.

Or again, there are instances of small current assets and large current liabilities where the trend constantly shows a greater increase in current assets than the increase in liabilities. Such a trend, of course, is favorable, and yet the ratio between the two on the last financial statement might still be so far out of line that credit men would not feel justified in extending accommodations.

Both Methods Useful.—It is not fair, therefore, to say that the trend percentage method is a complete substitute for the ratio method.

It is fair to say, however, that the trend percentage method is far more effective than the ratio method for showing trends. It is also fair to say that the study of trends is vitally important in diagnosing the capability of business management, which is, after all, the major factor, as every business man realizes.

The common sense judgment in the case of ratio method versus the trend percentage method involves a judicious compromise. The well-rounded analyst will adopt the trend percentage method as the most effective instrument for studying trends and will supplement it by determining the few really significant ratios for the latest of a series of balance sheets under survey.

This does not necessarily mean that all of the ratios already discussed will be calculated for the most recent balance sheet of a series.

Often the mere survey of the figures themselves may supplement the trend study without the actual calculation of any ratios. In the great majority of remaining instances, determination of the current ratio and the "acid test" will suffice. In rare instances or in special studies even further ratio calculations may be made, but it is safe to say that these occasions will be quite rare.

Analysis Methods as Tools.—This distinction between studying present condition (involving ratios) and studying trends (involving the trend percentage method) is an important one, and failure to appreciate it may lead into absurdities.

An attempt to use the ratio method as the sole instrument of financial analysis is equivalent to a carpenter using one tool for two quite dissimilar operations. Because a plane has a cutting edge, and might, therefore, be used as a chisel, is no good reason for so employing it. Similarly, because the ratio method will, in a clumsy way, indicate trends, is no reason for employing it when a better, quicker, and more graphic method is available.

The vital importance of trend study seems to have been recognized by Alexander Wall, Secretary of the Robert Morris Associates, whose contributions to the ratio method, particularly in the field of credit analysis, have been great.

In his book, "Analytical Credits," he says, "The real fundamental value of a study of the current ratio lies not so much in the development of the percentage at which the current ratio rests, as in a study of the direction in which the current ratio is traveling."

Other authors, by exhibiting comparative statements, admit the overwhelming importance of trend study.

Combining the Two Methods.—An interesting suggestion has been made by Mr. Wall, the apparent purpose of which is to combine the good features of both the ratio method and the trend method. He attempts to do this by first figuring out all the ratios for a series of statements. He then calculates the trends of the ratios, and finally he assigns weights to each ratio based on his estimate of their relative importance, and adjusts the trend percentages of the ratios accordingly.

Without attempting to discuss the mathematical merits and demerits of Mr. Wall's suggestion, it is nevertheless true that simple analysis methods are the best, and that there is great danger in getting too far away from the actual figures. Simplicity appears to be one of the principal advantages of the trend method over the ratio method.

Mr. Wall's method takes (1) the ratios which are already too cumbersome for practical use, (2) converts them into trends, and (3) again into weighted trends, i.e., three complete steps away from the original figures themselves.

Even if this method gave a closer interpretation of the balance sheet, which is extremely doubtful, it would still be impracticable for ordinary use because of the difficulty of explaining the method to a client or employer.

CHAPTER XIII

STANDARD RATIOS

A Second Use for Ratios.—So far balance sheet ratios have been discussed from only one angle—that of ratios taken from successive balance sheets of the same company.

From this study certain information may be secured as to the trend of the company's affairs. While the trend percentage method gives a quicker and clearer view of trends, it must be admitted, as stated in the last chapter, that trend studies are possible with the ratio method.

Thus, for the Ames Manufacturing Company the ratio of sales to fixed assets was:

Date	Ratio
1921.....	290%
1922.....	258
1923.....	251
1924.....	260

These figures show a slightly unfavorable trend. This has already been discussed, and it has been shown that the Ames Manufacturing Company tended somewhat toward over-investment in fixed assets.

Where Is the Danger Point?—But there is still another important question to be settled. Has the situation with the Ames Manufacturing Company reached a danger point yet?

There must be some ratio of sales to fixed assets which represents such a danger point. But from an examination of the Ames Manufacturing Company ratios it is impossible to tell whether they have already fallen below such a danger point in 1921 or whether they were still above it in 1924.

If there was some way of knowing the ideal ratio of sales

to fixed assets for such a business as that of the Ames Manufacturing Company, then it would be a simple matter to compare the Ames' figures with such a standard figure.

Standard Ratios.—This idea of determining standard ratios for each line of business is not new. The first research work along these lines was probably undertaken in a limited way by the credit departments of very large manufacturers.

The first important published contribution to the subject appears to have been made by Alexander Wall, formerly a Detroit banker, who was commissioned by the Federal Reserve Board at Washington to make a thorough study of standard ratios and who later became Secretary of the Robert Morris Associates, an organization of bank credit men formed for the purpose of doing research work in standard ratios.

A much later study was made by James H. Bliss, Comptroller of Libby, McNeill and Libby, in his books entitled "Financial and Operating Ratios in Management" and "Management Through Accounts."

There are many who show much enthusiasm over standard ratios. The author of a recent article in a well-known technical journal refers to standard ratios as "enabling one to determine not only the standing of a given unit in an industry at a given moment, but also, *with a precision no less exact*, enabling one to point out the course that has been pursued and the rate attained in reaching that standing; and by the same means enabling one to foretell the fate of that industrial unit, that is, whither it is bound and what factors are accelerating or retarding its progress."

And again he says, "It furnishes a standard of normalcy, and *any function* of the concern that is not normal may be quickly determined and *a remedy may be pointed out*."

Portions of these quotations have been italicized to bring out the broad character of claims made for the standard ratio. If the standard ratio is so important an instrument for locating

business diseases, it is most decidedly worthy of detailed consideration here.

Construction of Standard Ratios.—The standard ratio idea is a very simple one.

If balance sheets could be secured from a number of different concerns in the same line of business, the ratios could be calculated separately and then averaged. Each such average ratio could then be considered a standard with which to compare the similar ratio of any individual company engaged in that line of business.

Reverting to the ratio of sales to fixed assets for the Ames Manufacturing Company, it seems that there are certain other companies in the same line of business whose balance sheets are available covering the same years of 1921 to 1924. These are given below. The dates and names are, of course, fictitious, but all the ratios given are based upon actual published balance sheets.

The ratios of sales to fixed assets for these various companies are as follows:

	1924
Ames Manufacturing Company.....	260%
Kard Manufacturing Company.....	143
General Manufacturing Company.....	144
Black Manufacturing Company.....	367
International Manufacturing Company.....	303
Arithmetic Average.....	<u>243%</u>

Comparison of Ratios.—When the 1924 ratios for the Ames Manufacturing Company are compared with those of the other four companies, its situation does not seem so bad.

Its 1924 ratio of 260% is above the ratios of two of the companies and below the ratios of the other two, and is above the average for the five.

It seems plain, therefore, that while the trend of this ratio for the Ames Manufacturing Company is downward, still it

has quite some distance to go before falling as low as the ratio of other representative companies in that same line of business.

Of course, there are a number of questions about the above figures which any alert person would immediately ask:

Is the industry as a whole suffering from some depression?

Are the companies in the above list representative?

Are there enough companies represented so that the resulting average may be considered reliable?

With five companies all engaged in the same line of business, why should one of them (The Black Manufacturing Company) show a ratio almost three times as large as that of another company (The Kard Manufacturing Company)?

Can this be accounted for because they are in different parts of the country?

Or, is it simply a false assumption that they are engaged in similar work?

Or is it a false assumption that well managed companies in the same line of business should all have ratios fairly close to the average?

These are only a few of many questions that might be asked. Certainly, the management of the Ames Manufacturing Company should not be complacent in view of their decreasing ratio when they see their competitors, The Black Manufacturing Company and The International Manufacturing Company with higher ratios.

Deviation of Figures.—Perhaps the most noticeable thing about the above figures is the difference between each of the figures and the average.

This is most clearly brought out by “over and under” figures, revealing how much each company’s ratio is above or below the average.

From this table can be seen how the different ratios vary from the average.

In other words the average is not typical.

	1924	Average	Over	Under
Ames Manufacturing Company	260%	243%	17%	—
Kard Manufacturing Company	143	243	—	100%
General Manufacturing Company	144	243	—	99
Black Manufacturing Company	367	243	124	—
International Manufacturing Company	303	243	60	—

Just what does this mean?

As an illustration, if John is two years old and George is 22 years, their average age is 12. But this average is not typical and if the average age of George and John is given as 12 years, a false impression is created.

If John is 11 and George is 13, this also gives an average age of 12, but is more nearly typical.

In the first instance, there is a large deviation from the average, John's age being 10 years on one side of the average and George's age 10 years on the other side of the average.

In the second illustration, John's and George's ages deviate only one year from the average.

Value of Averages.—The less deviation shown by individual numbers from their average, the more typical and reliable that average is.

In other words, the individual figures should "cluster" closely around their average if the average is to mean anything.

As a matter of fact, there is not a single one of the five companies which shows for the year 1924 a ratio of sales to fixed assets close to 243%. Not only does the average not typify the group, but it does not even typify any members of the group.

A careful study of the foregoing paragraphs will justify the conclusion that it is not safe to consider that the standard ratio of sales to fixed assets for the year 1924 is 243%, nor would anyone feel justified in using that as a yardstick for judging the position of the Ames Manufacturing Company.

What then is the remedy?

Securing Better Averages.—The remedy quite obviously is not to use five balance sheets, but 50.

And a further remedy is not to use the arithmetic average as has been done so far in this chapter, but to use some substitute for it which will more closely typify the actual figures.

The trouble with the arithmetic average, in this and other uses as well, is that it gives effect to unusual or “freak” figures.

To illustrate this in a simple manner, observe the following figures showing the daily incomes of six employees:

1.....	\$50.00
2.....	4.00
3.....	3.00
4.....	3.00
5.....	3.00
6.....	3.00
Total.....	<u>\$66.00</u>
Average.....	<u>\$11.00</u>

While mathematically speaking the average income is \$11 per day, this average is deceptive because one \$50 man was included. The common or typical income is \$3 per day. This is the income earned by four out of the six employees.

Any average figure must properly summarize the whole. It must be significant or typical of the whole, or it is a misleading average. The \$11 average in the above example does not conform to this fundamental rule.

As one authority says:

Every average is a sort of fictitious substitute for the details which it replaces, serviceable when the conditions for which it stands are known, but deceptive when they are ignored.

Substitute for Arithmetic Average.—For most business uses the arithmetic average should not be employed.

In place of the average it is better to use another figure

(sometimes improperly called an average), which is known as the "mode."

The mode is the typical figure.

It is the one which occurs most frequently.

Thus, there might be 10 companies showing ratios of sales to fixed assets as follows:

1.....	100%	6.....	300%
2.....	200	7.....	300
3.....	300	8.....	500
4.....	300	9.....	1,000
5.....	300	10.....	1,200

The arithmetic average of these is 450%. But the typical figure, or mode, is 300%, because the greatest number of the companies show 300% as the ratio. Therefore, 300% is the common or typical figure of the group.

It would be much wiser to use 300% as a standard instead of 450%, because the method of obtaining the 300% eliminates the "freak" figures of 1,000% and 1,200%.

But in order to determine the mode it is necessary to have quite a large number of individual figures. The ratios of the five companies that have been used as an illustration are not sufficient in number to calculate a mode. The ratios from 50 companies might be enough, but several hundred would be even better.

The "Mode" Illustrated.—The importance of the mode as compared with the arithmetic average in determining standard ratios was thoroughly recognized by Alexander Wall in his book, "Analytical Credits."

He showed there exactly the method by which he accumulated his figures. For one type of business he had 139 balance sheets from similar companies. From each he calculated the ratio of sales to inventories. This gave him 139 ratios.

He then took a sheet with 16 columns. In the first column he made a separate notation of each ratio that was under 300%; the second column he made a memorandum of each

ratio that was 300% or more, but less than 350%; in the third column he put down each ratio that was 350% or more, but less than 400%, and so on.

When he was all through, his sheet, with slight changes, appeared somewhat as follows:

WORKING SHEET FOR SALES TO INVENTORY STANDARD RATIO

Below 300	300 to 349	350 to 399	400 to 449	450 to 499	500 to 549	550 to 599	600 to 649	650 to 699	700 to 749	750 to 799	800 to 849	850 to 899	900 to 949	950 to 999	1000 and Over
280	308	376	418	498	516	575	613	694	733	758	820		921		1010
	337	389	444	472	504	552	634	694	729	763	841		923		1030
	314	397	416	468	533	563	612	674	712	772	817		948		1040
	346	389	427	459	508	575	614	658	710	768	841		926		1000
	343	398	441	491	504	552	630	655	710	788	820		941		1145
		387	439	481	539	593	600	669	702	754			932		1113
		391	412	473	517	591		675	725	787					1181
		389	444	464	535	558		665	717	796					1305
		393	412	478	525	560		650	733						1311
			439	454	533	593		677							1370
			401	450	523	574									
			438	498	529	563									
			432	452	531	556									
				461	516	578									
				478	506	563									
				484	512	564									
				450	513	592									
				452	533										
				486	529										
				474											
				478											
No. in Group															
	1	5	9	13	21	19	17	6	10	9	8	5	6		10

The greatest number of ratios appear in the fifth column. This is the column which shows the ratios between 450% and 499%.

In other words, the mode lies somewhere between 450% and 499%.

Group Location.—This is close enough for all practical purposes. It is seldom possible to locate the mode exactly. Usually it is necessary to locate it somewhere within a group, as in the above illustration.

As a matter of fact the typical figure is closer to 499% than it is to 450%, because the sixth column is also a long one, containing 19 figures, and the seventh one is quite long as well.

In fact, 57 of the 139 ratios fall in these three columns, i.e., between 450% and 599%. It is contended, therefore, that any individual company in this same line of business whose ratio of sales to inventories is under 599% and more than 450%, conforms to the standard or average.

A study of the above table shows what great difference in ratios are to be found between different companies in the same line of business. In other words, there is great deviation from the average.

It appears to be almost impossible to summarize all of these 139 ratios by one single average. A much better method would be to summarize all of the ratios into groups as follows:

Groups of Ratios	No. of Companies
299 and lower	1
300 to 349	5
350 to 399	9
400 to 449	13
450 to 499	21
500 to 549	19
550 to 599	17
600 to 649	6
650 to 699	10
700 to 749	9
750 to 799	8
800 to 849	5
850 to 899	0
900 to 949	6
950 to 999	0
1,000 and above	10
	<u>139</u>

With the figures summarized in this manner they are much easier to interpret, and the standing of any given company is

much easier to determine by comparison with this table than by comparison with one average.

Objections to Standard Ratios—Geographic Distribution.—The balance sheet ratios of any company depend upon a number of factors which are the result of business policies and are influenced by the size of the company, its geographical location and other factors.

Alexander Wall, at the time he made his investigation for the Federal Reserve Board, found it necessary to divide the United States into nine sections and to determine standard balance sheet ratios for each separately.

This means that a very large number of balance sheets of similar companies are necessary in order to obtain dependable averages for each geographical section. Procuring such a large number of balance sheets is a difficult task unless handled by an association or governmental body.

Great difficulties are faced by individuals in attempting to gather such balance sheets. It is observed that J. H. Bliss, author of "Financial and Operating Ratios in Management," was able to procure for analysis the balance sheets of less than 250 companies. These were distributed over more than 40 different lines of business with the result that some of the lines of business were so small as to include only one, two or three companies.

His largest group of companies whose figures were available for determining the ratio of sales to inventory was 12—an entirely inadequate number of instances to serve as the basis for determining a mode for a standard ratio. Bliss did not attempt to follow Wall's example of accumulating his averages geographically. Had he done so the resulting groups would have been even more scanty.

A large number of balance sheets are necessary, but where such a large number are involved there is still another difficulty.

Factor of Business Mortality.—Failure statistics show that the mortality among business concerns is very heavy.

Figures have been published showing very small chances of life of more than 15 years among manufacturers, wholesalers and retailers.

When it is also borne in mind that the average business life of a retailer, manufacturer, or wholesaler is somewhere between seven and seven and one-half years, it can be appreciated that any large number of balance sheets must include many concerns whose span of life is short.

Size of Business.—Furthermore, most business concerns are small and not very successful.

The 1919 statistics, as quoted by Lincoln in "Applied Business Finance," show that 79.6% of manufacturing concerns reported gross annual sales of less than \$100,000. Moreover, nearly one-third of all industrial organizations in that same year showed deficits instead of profits.

These facts put the user of standard ratios in a serious predicament. If he uses the balance sheets of successful concerns only, he will find the number so few, after dividing them geographically, that unreliable averages must result.

On the other hand, if he is fortunate enough to secure a large number of balance sheets, he must face the fact that this number will include a heavy proportion of small or unsuccessful concerns. The resulting standard ratios must, therefore, be misleading if they are to be considered as "ideal."

Accounting Classification.—Furthermore, standard accounting classification throughout an industry is almost essential before reliable standard ratios can be hoped for.

Oftentimes two different companies will show different ratios due to the fact that their bookkeeping methods are different, whereas, they might show almost identical ratios if their bookkeeping methods were uniform.

Considerable work has been done to promote standard

accounting classification, particularly in such lines as the baking, biscuit and cracker business, face brick, paving brick, caskets, foundries, portland cement factories, chair factories, cotton finishers, electrical products, envelope makers, granite makers, ice manufacturers, knit goods manufacturers, laundries, lithographers, machine tool manufacturers, millwork, paint, paper, pottery, and stove manufacturers, tanners, toy makers, and wooden ware manufacturers.

At the present time, however, the attitude of the Federal Trade Commission toward uniform accounting systems is somewhat unfavorable because of its belief that such uniform accounting systems lead to price fixing and elimination of competition, which is in restraint of trade.

Importance of Recent Figures.—As the author firmly believes that published standard ratios as given in certain books are almost valueless, no attempt has been made here to include lengthy tables showing such ratios.

Most of the available figures are old, and standard ratios unless right up to date certainly are not safe guides, even assuming no other objections to them.

This is quite clearly brought out by published facts. Ratios of sales to inventories of six automobile accessory manufacturers, as reported by one author, dropped from 499% in 1918 to 401% in 1920.

Another startling illustration is that of 12 copper mining and smelting manufacturers, whose average ratio of sales to inventories dropped from 268% in 1920 to 85% in 1921.

Any balance sheet analyst who would attempt to compare the 1921 ratio for any particular copper mining company with the 1920 average of 268% (assuming later figures not available) would obtain an entirely misleading impression.

Uniformity of Policies.—The assumption underlying the standard ratio is that of uniformity of policy, method, procedure and product within a given line of business.

Unfortunately the assumption is often untrue. Simply because two companies make automobiles is no indication of uniformity in certain factors that influence their ratios. One may manufacture a large part of its product. The other may buy standard parts and assemble them into finished cars.

Since the first would require much more extensive plant, machinery and equipment than the other, is it reasonable to assume that their ratios of sales to fixed assets would be comparable?

One, like the Ford Motor Company, might sell for cash. Another might have the cash basis as its ideal but actually sell on long terms.

Would it be fair to consider that their ratios of sales to receivables ought to be nearly alike?

One might be financed entirely through stock widely distributed. The other might be directly financed to a limited extent by a few men of ample means who would prefer to finance the remainder of all capital required by lending their credit through their endorsement of the company's notes to the bank.

Would the ratios of net worth to fixed assets and to total liabilities for the two companies be the same?

Similarly with other factors which influence ratios. It often happens that companies that seem to be alike are really very dissimilar.

Elements of Value in Standard Ratios.—But the standard ratio idea cannot be entirely condemned. It has elements of value under very special circumstances.

FOR THE PUBLIC ACCOUNTANT.—Thus the public accountant who serves a number of clients in the same general industry can perform a helpful service to them all by using this standard ratio idea.

He can use it effectively because of his intimate familiarity

with the accounting records and the policies of each company. His information in regard to each is so detailed that differences between the balance sheet ratios of the various companies can be reconciled.

The public accountant's knowledge of the peculiar condition under which each operates will enable him to make a shrewd comparative analysis as the basis for constructive suggestions of inestimable value to each client.

And this may be done without divulging any information having a competitive bearing.

The public accountant will ordinarily figure the ratios of each such plant separately and since they will usually be few in number, he need not average the results.

Preferably, he will list the similar ratios for the various clients in their proper order from low to high, and then through his detailed knowledge of the circumstances of each will satisfy himself as to the causes underlying the very low or very high ratios.

FOR THE COMPTROLLER.—The comptroller of a corporation, or any of its general executives, may attempt much the same plan, except that it is usually necessary to secure the balance sheets of competitors from financial manuals, such as Moody's, or from other sources.

The keen analyst will secure a surprising amount of valuable information through such comparative study. His knowledge of his own business and of the policies of his competitors will enable him to explain or reconcile many peculiarities of the balance sheets.

No formal system of analyzing the facts need be followed by one making such an analysis. His inspection of the various balance sheets will alone give much information. His figuring of ratios may not be on a formal statistical basis. In fact, the procedure will probably be quite different from that required to determine nation-wide standard ratios for an entire industry.

Summary of Important Factors.—In conclusion it seems clear that the “standard ratio” is not feasible except under an unusual combination of conditions where:

1. A large number of balance sheets taken at the same time of year are available.
2. The corporations furnishing the balance sheets are financially sound.
3. The corporations operate under similar geographic conditions.
4. The balance sheets are of recent date.
5. The deviations of the individual ratios from the average ratio are not too great.
6. Accounting methods throughout the industry are substantially uniform.
7. The business policies which influence ratios are substantially uniform.
8. The products manufactured and sold are substantially similar.

This combination occurs so rarely as to deserve little consideration.

The chief, if not the only value, of the standard ratios lies in the fact that they represent starting points for further investigation.

Unfortunately the average individual analyst has no opportunities to make such further investigations.

Thus, the prospective investor contemplating the purchase of stock in the Texas Company might observe that its 1921 ratio of sales to inventory was 137%.

He might compare this with the 1921 ratios of other oil companies as published by one author:

Texas Oil Company.....	137%
Associated Oil Company.....	627
California Petroleum Company.....	2,881
Tide Water Oil Company.....	293
Union Oil Company of California.....	261
Pure Oil Company.....	557
Average.....	<u>252%</u>

The average is evidently a weighted average, since it is not a mode and since the arithmetic average is 792%.

After the prospective investor has compared the ratio of 137% with the others and with the average, he is at a standstill. He would like to use the figures as a basis for further investigation but has no facilities for doing so; no opportunities for access to the detailed figures which form the basis of the several ratios; no right to inquire into the causes that result in the wide deviations.

The credit man is in about the same position—interested but often powerless to press the searching questions which might shed light on the differences between these oil companies.

If the analyst were an executive of the Texas Company or its consulting auditor, he might be able to go further in reconciliation, because of knowledge of various petroleum trade practices, marketing and collection policies, etc.

As already said, to such an analyst the standard ratio represents a starting point for further investigation and a challenge to his analytical ability.

But the great majority of analysts would find their comparison with the standard ratio an unsatisfactory finishing point rather than a starting point.

Ideal vs. Standard Ratios.—A suggestion has been made by some who admit that reliable average ratios are difficult, if not impossible to obtain.

This suggestion has to do with the possibility of securing "ideal" ratios.

These would not be averages of ratios of good, bad and indifferent companies, imperfectly grouped because of insufficient investigation.

Rather "ideal" ratios would result from a thorough scientific study of the most efficient companies in a given group, taking into consideration variations in at least the following items:

1. Geographical location.
2. Products sold.
3. Methods of marketing.
4. Terms of sale.
5. Collection policies.
6. Manufacturing policies.
7. General financial policies, etc.
8. The business cycle.

Each has its effect on one or more of the common ratios. A careful weighing of these factors in connection with such a research would be a great stride forward in the hunt for the "ideal" industry ratio.

As far as is now known, no attempt has been or is being made to carry on such a research. It may be an impossible task. Certainly it would be a costly one, since it would require patient examination into the affairs of each company.

It would involve much more than the securing of balance sheets from published sources, such as Moody's Manuals, the clerical compilation of ratios and their averaging in a purely mechanical way, proceeding on the assumption that the companies are alike in policies, methods and products simply because they are engaged in what superficially appears to be the same "line of business."

CHAPTER XIV

CONCLUSIONS AS TO ANALYSIS TECHNIQUE

Summary of Analysis Methods.—The following methods of balance sheet analysis have been discussed in previous chapters:

A. Single balance sheets:

1. General ratios (Chapter IV).
2. Arbitrarily scaling down balance sheet values (Chapter IV).
3. Danger signals (Chapter IV):
 - a. Small amount of cash.
 - b. Improper combinations of balance sheet items.
 - c. Heavy notes receivable counter to trade practice.
 - d. Large intangible assets particularly when there is no surplus.
4. Standard ratios (Chapter XIII).

B. Two or more balance sheets:

1. General ratios (Chapter V).
2. Increase and decrease calculations (Chapter V).
 - a. Application of funds.
3. Percentages using total assets as 100% (Chapter V).
4. Ratios directed toward specific business ailments (Chapters VI, VII, VIII, and IX).
5. Trend percentage method for showing trends toward specific business ailments (Chapters XI and XII).
6. Standard ratios (Chapter XIII).

Since some of these methods are better than others, it seems appropriate to furnish a list or schedule representing recommended steps in analyzing (1) a single balance sheet, and (2) two or more balance sheets of the same company.

Analysis Program for One Balance Sheet.—For the single balance sheet, the following will usually be found sufficient:

1. Calculate the ratios:
 - a. Acid test.
 - b. Current ratio.
 - c. Ratio of sales to receivables (if sales figures are available).
 - d. Ratio of sales to inventory (if sales figures are available).
2. Check for danger signals:
 - a. Disproportionately small amount of cash.
 - b. Improper combination of balance sheet items.
 - c. Disproportionately large amount of notes receivable counter to trade custom.
 - d. Disproportionately large intangible assets, particularly when there is no surplus.
3. Scrutiny of the balance sheet in order to insure common-sense conclusions.

Analysis Program for Two or More Balance Sheets.—For two or more balance sheets of the same company the following is the line of analysis to be followed:

1. Calculate the trend percentages for:
 - a. Receivables.
 - b. Quick assets.
 - c. Inventories.
 - d. Current assets.
 - e. Fixed assets.
 - f. Current liabilities.
 - g. Long-time liabilities.
 - h. Total liabilities.
 - i. Net worth (or capital stock and surplus separately).
2. Study the trend percentages for trends toward:
 - a. Over-investment in receivables.
 - b. Over-investment in inventory.
 - c. Over-investment in fixed assets.
 - d. Insufficient capitalization.

3. For the latest balance sheet of the series:
 - a. Calculate the "acid test" ratio.
 - b. Calculate the current ratio.
 - c. Check for the four danger signals.
 - d. Determine whether unfavorable trends have reached a danger point.
4. Scrutinize the balance sheets in order to insure common-sense conclusions.

Discussion of Analysis Programs.—It should be observed that these two schedules, covering the single balance sheet and two or more balance sheets, are designed to fit the usual analytical requirements. They represent the bare essentials of complete balance sheet analysis, and for unusual cases additional ratio, trend, or other studies may be made.

Special circumstances justify elasticity in the analysis procedure. Unusual types of business may call for resourcefulness in devising methods of interpreting statements.

Also the analyst will always be eager to employ all available information to test his conclusions. Thus where a company's stock is listed on a stock exchange, a comparison of its quoted prices with the book value of shares as shown by the balance sheets, is often illuminating, not only to prospective investors but also to other classes of analysts.

Special importance should attach to the last item in each of these "analysis programs."

What may be termed the "common-sense scrutiny" should be the last step—not the first as so often occurs.

It should be the last step because the previous steps often bring out certain trends toward common business ailments.

It is after those trends have been observed that a deliberate general scrutiny of the statement or statements is of real value in insuring that common sense is back of the conclusions.

The Checking List.—The conclusions finally reached may profitably be put in written form as answers to the following

questions (and in offices where a great many statements are analyzed a checking list based on these questions may well be employed) :

1. Is there any dangerous tendency toward:
 - a. Over-investment in receivables?
 - b. Over-investment in inventory?
 - c. Over-investment in fixed assets?
 - d. Insufficient capital?
2. Is the present position, as evidenced by the acid test, current ratio and other ratios, satisfactory?
3. Are any of the four danger signals present?

CHAPTER XV

PROFIT AND LOSS ANALYSIS

Changing Conditions in Relation to Profit and Loss Analysis.—While a great deal has been published at different times on the subject of balance sheet analysis, little if anything has been written about analyzing profit and loss statements.

There is an excellent reason for this.

Until recently books and articles dealing with analysis of financial statements have approached the subject purely from the viewpoint of the credit man, engaged in either commercial or bank credit work, and, generally speaking, credit men have been able to secure from their customers only balance sheets. Profit and loss figures have been considered by business men entirely too confidential for even limited distribution.

Since the balance sheet has usually been the only financial statement available to credit men, authors have concentrated their attention on balance sheet analysis.

Profit and loss statements are difficult to obtain. Only too rarely have they been completely published in the past.

Conditions are changing and business men are realizing more and more that publicity given to their profit and loss statements, either through commercial agencies or direct to their creditors will seldom prove harmful.

Another reason why so little has been written on the subject is that much analysis work is from the internal viewpoint.

Within each corporation there is some major executive who makes it his task to study carefully his company's own profit and loss figures. Such work is of the most fundamental and far reaching significance in business administration and forms an important basis for increasing profits.

Such an executive is able to make a complete investigation

in connection with every questionable item he discovers, since he has access to all the supplementary and subsidiary records from which the statement was built.

The public accountant in serving his client possesses this same advantage.

Need for Method of Analysis.—But there are many others who are called upon to analyze profit and loss statements without having the privilege of detailed investigation in connection with particular items upon which they desire further information.

To meet such needs, a distinct method or technique of analysis should be available. Such a technique has been established for balance sheet analysis and the present purpose is to outline similar plans and methods for diagnosing the profit and loss statement.

These methods can well be used by the executive, even though he does have access to the detailed figures, in his preliminary analysis of the periodical statements, as a means for localizing unfavorable symptoms. Also, they may be used by the public accountant for the same purpose.

But these methods are of even more vital importance to credit men, bankers, and investors.

Purpose of Analysis.—Therefore, the present question is how to make a general analysis of profit and loss statements for the purpose of diagnosing symptoms rather than for the purpose of a complete investigation to determine remedies for unfavorable symptoms.

The fundamental structure of a profit and loss statement is simplicity itself, since it conforms to the following formula:

TOTAL INCOME
less
TOTAL COSTS
equals
NET PROFIT

More Detailed Classification.—The actual structure of a profit and loss statement must be somewhat more elaborate for several reasons.

In the first place income is of two kinds: (1) Operating income and (2) non-operating income, such as interest from investments, rent from non-operating properties, etc.

Secondly the costs are commonly of three general kinds:

1. Direct costs of furnishing the service or of manufacturing or buying the merchandise sold.
2. Operating expenses necessitated thereby.
3. Non-operating expenses.

Therefore, the general structure of most profit and loss statements closely conforms to the following formula:

OPERATING INCOME
less
COST OF SERVICE RENDERED OR OF GOODS SOLD
equals
GROSS TRADING PROFIT
less
OPERATING EXPENSE (usually highly classified)
equals
NET OPERATING PROFIT
plus
NON-OPERATING (or other) INCOME
less
NON-OPERATING (or other) EXPENSE
equals
NET PROFIT

The important factors in this formula are (1) the operating income, (2) the cost of goods (or services) sold, and (3) the operating expenses. The combination of the first two results in the significant figure of gross profit or gross trading profit, and the combination of the three results in the significant figure of net operating profit.

Usually, but not always, the non-operating items are insignificant from the analyst's viewpoint. The first three mentioned are the ones of primary importance.

Illustrative Figures.—For the purpose of having definite figures to illustrate the various points involved, the balance sheets and profit and loss statements for a trading organization, which, for the purpose of making the illustration specific, may be called Andrews and Company, are shown here:

ANDREWS AND COMPANY
COMPARATIVE BALANCE SHEET
As of December 31

<i>Assets</i>	1917	1918	1919	1920
Quick Assets.....	\$ 24,414	\$ 32,063	\$ 38,509	\$ 42,326
Inventories.....	79,891	93,817	94,756	97,622
Fixed Assets.....	46,720	45,352	43,791	42,802
Total.....	<u>\$151,025</u>	<u>\$171,232</u>	<u>\$177,056</u>	<u>\$182,750</u>
<i>Liabilities and Capital</i>				
Current Liabilities.....	\$ 38,045	\$ 52,927	\$ 50,952	\$ 75,483
Net Worth.....	112,980	118,305	126,104	107,267
Total.....	<u>\$151,025</u>	<u>\$171,232</u>	<u>\$177,056</u>	<u>\$182,750</u>
Sales (Net).....	<u>\$140,161</u>	<u>\$194,324</u>	<u>\$273,040</u>	<u>\$286,445</u>

ANDREWS AND COMPANY
COMPARATIVE TRADING AND PROFIT AND LOSS STATEMENT
Years Ended December 31

	1917	1918	1919	1920
Gross Sales.....	\$141,479	\$196,028	\$279,229	\$288,757
Less: Goods Returned.....	1,318	1,704	6,189	2,312
Net Sales.....	<u>\$140,161</u>	<u>\$194,324</u>	<u>\$273,040</u>	<u>\$286,445</u>

COST OF GOODS SOLD:

Inventory—Beginning.....	\$ 72,991	\$ 79,891	\$ 93,817	\$ 94,756
Purchases.....	114,293	165,987	209,536	260,642
Freight on Purchases.....	1,357	1,674	2,358	2,629
	<u>\$188,641</u>	<u>\$247,552</u>	<u>\$305,711</u>	<u>\$358,027</u>
Less: Inventory—End.....	79,891	93,817	94,756	97,621
Cost of Goods Sold.....	<u>\$108,750</u>	<u>\$153,735</u>	<u>\$210,955</u>	<u>\$260,406</u>
Gross Profit.....	<u>\$ 31,411</u>	<u>\$ 40,589</u>	<u>\$ 62,085</u>	<u>\$ 26,039</u>

OPERATING EXPENSES:

Store Expense:

Salaries—Dept. Managers..	\$ 4,700	\$ 5,656	\$ 14,700	\$ 13,646
Salaries—Salesmen.....	5,820	6,369	10,043	12,012
Light and Power.....	203	133	187	187
Insurance.....	457	962	785	771
Luxury Tax.....	—	—	122	166
State Income Tax.....	643	958	1,113	—
City Tax.....	1,900	1,405	1,634	2,104
Fuel.....	323	240	352	286
Depreciation.....	1,482	1,484	1,484	1,493
Repairs.....	83	23	8	311
General Store Expense.....	153	93	135	117
Paper and Twine.....	117	220	355	230
Total.....	<u>\$ 15,881</u>	<u>\$ 17,543</u>	<u>\$ 30,918</u>	<u>\$ 31,323</u>

General and Administrative

Expense:

Telephone and Telegraph...	\$ 31	\$ 61	\$ 51	\$ 64
Printing and Stationery....	247	132	106	155
Charity and Donations.....	—	—	—	25
Subscriptions and Dues....	22	62	64	144
Legal and Auditing.....	129	—	—	—
Advertising.....	511	480	697	784
Traveling Expense.....	37	33	86	75
Bad Debts.....	197	648	5	70
Total.....	<u>\$ 1,174</u>	<u>\$ 1,416</u>	<u>\$ 1,009</u>	<u>\$ 1,317</u>
Total Operating Expense.	<u>\$ 17,055</u>	<u>\$ 18,959</u>	<u>\$ 31,927</u>	<u>\$ 32,640</u>
Net Operating Profit (or Loss*).....	\$ 14,356	\$ 21,630	\$ 30,158	\$ 6,601*

OTHER INCOME:

Rent Earned.....	225	225	225	225
	<u>\$ 14,581</u>	<u>\$ 21,855</u>	<u>\$ 30,383</u>	<u>\$ 6,376*</u>

OTHER EXPENSES:

Interest Paid.....	\$ 2,054	\$ 2,846	\$ 2,911	\$ 3,765
Soldier's and Educational Bonus Surtax.....	—	—	936	—
Capital Stock Tax.....	—	108	95	113
	<u>\$ 2,054</u>	<u>\$ 2,954</u>	<u>\$ 3,942</u>	<u>\$ 3,878</u>
Net Profit or Loss*.....	<u>\$ 12,527</u>	<u>\$ 18,901</u>	<u>\$ 26,441</u>	<u>\$ 10,254*</u>

Analysis of the Balance Sheets.—Since there always exist important relationships between balance sheets and profit and loss statements, it is interesting and instructive to make a brief survey of the balance sheet before starting on the profit and loss figures.

ANDREWS AND COMPANY
ANALYSIS OF COMPARATIVE BALANCE SHEET
'As of December 31

(Based on percentages of 1917 figures)

	1917 Amount	1918 Percentage of 1917	1919 Percentage of 1917	1920 Percentage of 1917
Quick Assets.....	\$ 24,414	131	158	173
Inventories.....	79,891	117	119	122
Fixed Assets.....	46,720	98	94	92
Total.....	<u>\$151,025</u>	—	—	—
Current Liabilities.....	\$ 38,045	139	134	198
Net Worth.....	<u>112,980</u>	105	112	95
Total.....	<u>\$151,025</u>	—	—	—
Sales.....	\$140,161	138	195	204

Without attempting a complete diagnosis of the balance sheet, it is sufficient to note that the outstanding features are the heavy increase in quick assets, the heavier increase in current liabilities, and an indication of insufficient capitalization.

It is quite evident that in 1920 Andrews and Company was in a less favorable balance sheet position than in 1917, or in either of the two years intervening. With this picture of conditions clearly in mind, the analysis of the profit and loss statement may proceed.

First Step in Profit and Loss Analysis.—The first step is to determine the sufficiency of the net profits, i.e., the relation of the net profits to the net worth of the company.

For this purpose either the net worth at the beginning of each year or the average of the beginning and ending net worths should be used. Both methods are shown here.

Year	Net Worth Beginning of Year	Average Net Worth	Net Profits or (*) Deficit	Percentages on First of Year	Net Worth Average
1917...	—	—	\$12,527	—	—
1918...	\$112,980	\$115,642	18,901	17	16
1919...	118,305	122,204	26,441	22	22
1920...	126,104	116,685	10,254*	—	—

It is difficult to state what represents a sufficient profit. Few, if any, business men would ever admit that they were making a sufficient profit.

As to what constitutes an insufficient profit there is also uncertainty. Surely the profit from an enterprise should be in excess of current interest rates on high-class investments, as otherwise the stockholders would be better off if their money were withdrawn and put into bonds or commercial paper.

Insufficient Profits.—But current interest rates certainly represent the very minimum that profits should reach.

In a speculative business they should be substantially in excess of the average return on good bonds in order to compensate stockholders for the risks they assumed in investing. There is no reliable guide as to what represents a reasonable return on a business venture, but it probably lies somewhere between 10% and 15% of the net worth of the business. Profits between 6% and 10% may be considered unsatisfactory, while profits below 6% may be considered insufficient.

These rather arbitrary figures require some modification in any given instance, based upon the hazards of the enterprise. Other things being equal, the more risk there is involved, the greater should be the minimum percentage of net profit returns.

If these figures are accepted as substantially correct, then Andrews and Company showed satisfactory profits until 1920.

The next step is to determine the reason for the bad profit showing in 1920.

Summarizing the Profit and Loss Statement.—The profit and loss statement as above given is entirely too detailed for the next step in analysis.

The next step is to determine which of the three basic divisions of the profit and loss statement is responsible for the insufficient profit.

This leads directly into the fundamental theory of net profit.

In a trading business, net profit comes from buying goods at one price and selling them at a price sufficiently greater to provide a margin which will more than absorb all the operating expenses of the business.

This means, as already set forth, that there are really three important factors to be watched in connection with profit and loss analysis:

1. Income from operations or net sales.
2. Costs of goods sold.
3. Operating expenses.

Locating Losses.—The cause of a loss may be found in any of these three divisions. Even if merchandise is purchased at the right price and expense is kept at a reasonable amount, a net profit may be turned into a net loss by a failure to sell goods at a sufficiently high price.

Or on the other hand, the sales price may be right, operating expenses may be normal, and a loss be traceable to unwise purchases.

Even more commonly, the difficulty may be charged against the operating expense classification. This means that goods may be bought right and sold right, and still a net loss occur because the operating expenses are larger than the gross profit.

Analysis of Expense.—This often comes about because many items composing operating expense are in the nature of charges which do not fluctuate in direct proportion to the volume of sales.

In the Andrews and Company statement a number of items fall into this class. Consider light and power, which in 1917 amounted to \$202.68 and in 1920 to \$187.35, in spite of the fact that the volume of business was more than doubled.

This is also true in connection with fuel, an item which actually decreased over the four years' period in spite of the increase in the volume of business.

Depreciation was practically a fixed quantity during those years.

Examples of such expense items from other businesses are :

Rent	Taxes
Bond interest	Executives' salaries, etc.

Such expenses must be met if a company is to keep in business, and they go on just about the same month after month and year after year regardless (or practically so) of the volume of business which is being performed. The aggregate of such items represents almost an inflexible quantity—a fixed charge which cannot be reduced readily to fit a decreasing volume of business.

Other Classes of Expense.—There are other expenses which are partially fixed and which vary but slightly with increases or decreases in the amount of sales. The cost of that insurance which represents protection of merchandise has ordinarily some fairly definite relationship to sales volume.

Items such as paper and twine have a relationship to sales as do telephone and telegraph; also traveling expense under usual circumstances, although this does not appear to be true in the Andrews and Company statement.

Finally, there are expense items, such as salaries of salesmen, which one would naturally expect to increase or decrease in rather close relationship to sales volume, although they are easier to increase than to decrease unless a strict commission basis of compensation is followed.

Danger in Operating Expense.—In operating expense, therefore, usually lies the greatest menace to net profit.

It is the inflexibility of many of the operating expense items which forces sales volume. There is always a certain minimum of sales volume absolutely necessary in order that the resulting gross profit be as great as the operating expense.

Since, generally speaking, operating expenses should not increase as rapidly as sales volume, it is usually thought by executives that the answer to the problem of insufficient profit lies in increasing sales. While this is often one of the solutions of the net profit problem, it is not the only solution.

Trading vs. Manufacturing.—The foregoing discussion refers to trading enterprises only.

With reference to manufacturing, there are certain fixed charges due to manufacturing overhead expense, which form a large part of the cost of goods sold. Naturally in a trading business where all merchandise is purchased in finished form, this factor of manufacturing overhead does not complicate the situation.

Usual Percentage Analysis.—The analysis ordinarily made of a profit and loss statement is to determine the percentage each item for each year bears to the net sales of that year. This is not to be confused with the trend percentage method.

ANDREWS AND COMPANY
COMPARATIVE TRADING AND PROFIT AND LOSS STATEMENT
For the Years Ended December 31

	1917		1918		1919		1920	
	Amount	%	Amount	%	Amount	%	Amount	%
Net Sales.....	\$140,161	100	\$194,324	100	\$273,040	100	\$286,445	100
Cost of Goods Sold.....	108,750	77	153,735	79	210,955	77	260,406	91
Gross Profit.....	\$ 31,411	23	\$ 40,589	21	\$ 62,085	23	\$ 26,039	9
Operating Expense.....	17,055	12	18,959	10	31,927	12	32,640	11
Net Operating Profit (or Loss *).....	<u>\$ 14,356</u>	<u>10</u>	<u>\$ 21,630</u>	<u>11</u>	<u>\$ 30,158</u>	<u>11</u>	<u>\$ 6,601*</u>	<u>—</u>

On the face of it the situation of Andrews and Company requires serious and prompt attention. The 1920 figures show \$140,000 increase in sales over 1917, while the net profit decreased \$20,000. Obviously something is wrong with their affairs. This kind of a percentage analysis seems to show that the trouble lies entirely in the increase in cost of goods sold, which was raised from 77% of sales in 1917 to 91% of sales in 1920.

Principle Underlying This Method.—The principle underlying this method of analysis seems to be based on the thought that if cost of goods sold and operating expenses aggregated less than 100% of sales and remained at the same constant percentage relation to sales from year to year, it would be impossible to show a net operating loss, regardless of fluctuations in sales volume. And that if a net loss or undue decrease in profit appears, it is due to one or both of these elements getting out of such proper proportion to sales. And the next "logical step" appears to be to figure the percentages and find which item has gotten out of proportion.

Based on this reasoning the trouble in the case of Andrews and Company seems to be all chargeable against cost of goods sold, since the operating expense percentages have remained about the same, being 11% for 1920 as compared with 12% in 1917.

This type of percentage calculation usually represents the beginning and the end of profit and loss analysis. Seldom, if ever, does the analysis go any further than such a mere determination of percentages of the various items composing the profit and loss statement for each year, using sales of that year as 100%.

Advantages and Disadvantages of the Method.—There is nothing improper about the method. It is indeed quite useful when properly interpreted.

There should be a direct percentage relationship between

sales, cost of goods sold and gross profit—that part of the above percentage statement can be considered good practice in the analysis of any trading business.

It will be observed that, for analysis purposes, the figures have only been carried down to net operating profit or loss and that the items of other income and other expense have not been taken into consideration. Had these items been of real importance, they should, of course, have been included.

Wrong Impressions.—Where this analysis fails is in connection with operating expense.

The operating expense percentage for 1917 is 12% and for 1920 11%. This gives the impression that the cause of the dwindling profits did not lie even in part in this item. Superficially the operating expense seems entirely reasonable. If anything, improvement appears to have been shown.

As a matter of fact, there is but little logical relationship between operating expense and net sales in the average business. It has already been mentioned that a goodly portion of the operating expense usually consists of non-fluctuating items which change but little from year to year in direct relationship to the volume of business. To express such operating expenses as percentages of net sales is to deny this well-known fact.

A desirable method of analysis should bring sharply to attention all unfavorable factors rather than conceal any of them through illogical percentage relationships.

Standard Profit and Loss Ratios.—With this brief survey of the fault of this common type of percentage analysis, the next method is submitted.

In previous chapters standard balance sheet ratios were discussed.

If standard balance sheet ratios could be obtained, it should be possible to obtain equally good standard ratios for profit and loss statements, and some attempts have been made to do

so. The difficulty of obtaining profit and loss ratios is much greater than in the case of balance sheet ratios, since fewer companies publish profit and loss figures.

It appears that standard profit and loss ratios are almost an unattainable ideal, although in some instances it is possible to obtain through the financial manuals or other sources, reports which show sufficiently detailed profit and loss statements of other companies in the same line of business to enable an executive to make a fairly intelligent comparison of his own figures with those of his competitors.

In spite of the difficulties in the way of obtaining profit and loss ratios, it is nevertheless theoretically true that for every line of business there exists certain normal profit and loss ratios. These are influenced by the type of business, business policies, geographical location and the size of the enterprise.

Averaging the Statements.—A fairly good picture of the normal ratios for one particular business often can be obtained by combining statements for several years and then calculating the percentages.

If the individual percentages do not deviate too greatly from the averages thus calculated, and if the percentages of such a combined statement can be considered reasonably normal, these normal percentages can then be applied to the net sales of any single year and an "ideal" profit and loss statement constructed therefrom. This can then be compared with the actual figures for that year.

The results of such an analysis for Andrews and Company are shown herewith:

This method of analysis is not impractical. When properly used under correct conditions by a chief executive, or public accountant, such an analysis often forms the basis for remedying improper conditions. But as a general tool of statement analysis it finds no place.

ANDREWS AND COMPANY
ANALYSIS OF COMPARATIVE PROFIT AND LOSS STATEMENT

(Method involving average of three previous years as basis for standard percentage figures to be applied to sales of a later year, resulting in a fictitious "ideal statement" for comparison with actual statement of the later year.)

	Composite of 3 Previous Years		Obtained by Applying Average % to 1920 Sales		Actual 1920	Increase or *Decrease
Net Sales.....	\$607,525	100%	\$286,445	100%	\$286,445	—
Cost of Goods Sold.....	<u>473,440</u>	<u>78</u>	<u>223,427</u>	<u>78</u>	<u>260,406</u>	<u>\$36,979</u>
Gross Profit.....	\$134,085	22	\$ 63,018	22	\$ 26,039	*\$36,979
Operating Expense.....	<u>67,941</u>	<u>11</u>	<u>31,509</u>	<u>11</u>	<u>32,640</u>	<u>1,131</u>
Net Operating Profit (or *Loss)	<u>\$ 66,144</u>	<u>11</u>	<u>\$ 31,509</u>	<u>11</u>	<u>*\$ 6,601</u>	<u>*\$38,110</u>

Following are a few important objections to its use.

1. It is difficult to explain to the non-technical business man who is inclined to resent, as "theoretical," the artificial figures created by the averaging process.
2. It involves the untrue assumption that there exists an important relationship between net sales and operating expense which may lead to unsound conclusions.
3. Only in a fairly stable business will a series of individual profit and loss percentages be found which will not deviate too greatly from their average to be used as a reasonable standard.

These various serious objections render this method of analysis an impractical, if not a dangerous tool, except under the special circumstances already stated.

This analysis brings out very distinctly one cause of the lost profits in 1920.

It clearly indicates that if the percentage of costs of goods sold to net sales had been the same in 1920 as prevailed in the other three years, the company would have made a profit of \$31,200 instead of suffering a loss of \$6,601.

In other words, the difference between what actually happened and what should have happened based on past per-

centages is \$37,801, of which \$37,266 represents an excess in cost of goods sold.

The Trend Method.—The next procedure is to apply the trend percentage method of analysis to the Andrews and Company statement.

Each one of the three major elements of the 1917 statement may be considered as 100% and the figures of the succeeding years may be converted into percentages of the 1917 figures.

ANDREWS AND COMPANY
ANALYSIS OF COMPARATIVE PROFIT AND LOSS STATEMENT
Years Ended December 31

(Trend percentage method.)

	1917	1917	1918	1919	1920
	Amount	% of	Percentage	Percentage	Percentage
		1917	of 1917	of 1917	of 1917
Net Sales.....	\$140,161	100	139	195	204
Cost of Goods Sold..	108,750	100	141	194	239
Gross Profit.....	<u>\$ 31,411</u>	—	—	—	—
Operating Expense...	17,055	100	111	187	191
Net Profit (or *Loss)	<u>\$ 14,356</u>	—	—	—	—

This method is valuable because it brings out vividly the variations in operating expense as compared to variations in the other two factors.

It develops by mere inspection alone the interesting fact that operating expenses increased to 111% in 1918 and to 187% in 1919. In other words, the operating expenses for the year 1919 increased at a faster rate than the sales volume, which increased from 138% to 195%.

This a very important point and one which the previous methods of analysis did not clearly set forth. (The expense percentages based on net sales were 10% in 1918 and 12% in 1919.) Attention is immediately directed to the operating expense section of the 1918 and 1919 statements, where it is seen that the total operating expense increased from \$18,959 in 1918 to \$31,927 in 1919, an increase of \$12,968.

Analyzing Operating Expense Detail.—Usually this is as far as the analyst can proceed, because published profit and loss statements seldom furnish the detail of items composing operating expense.

But if such details are available, the next step is to narrow the investigation to the particular item or items responsible for the unfortunate showing. This additional investigation is fully set forth for completeness, in spite of the fact that obvious conclusions could be drawn from mere inspection of Andrews and Company operating expense details.

Each set of group totals within the operating expense section and the more important items composing each such group should be analyzed for trends in order to locate the difficulty as specifically as possible. Unlike the profit and loss statement of Andrews and Company, which only shows two divisions of operating expense, many statements show a number of such groups of items. The method to be followed is the same regardless of the number of such groups.

ANDREWS AND COMPANY
ANALYSIS OF OPERATING EXPENSE
Years Ended December 31

(Trend method.)

	1917 Amount	1917 % of 1917	1918 Percentage of 1917	1919 Percentage of 1917	1920 Percentage of 1917
STORE EXPENSE:					
Salaries—Dept.					
Managers..... \$	4,700	100	120	313	290
Salaries—Salesmen.....	5,820	100	109	173	206
Other Items.....	5,361	100	103	115	106
Total.....	<u>\$ 15,881</u>	100	111	195	197
GENERAL AND ADMINISTRATIVE EXPENSE:					
Advertising..... \$	511	100	94	136	153
Other Items.....	663	100	141	47	83
Total.....	<u>\$ 1,174</u>	100	120	87	112
Net Sales.....	\$140,161	100	139	195	204

Interpretation of Statement.—The smallness of the general and administrative expense renders its effect on net profit insignificant. But inspection of the trends of store expense and the items composing it, tells an important story.

Considerable responsibility for the bad net profit showing evidently falls on the two salary items.

Of the total increase of operating expense of \$12,968, by far the greater part (\$12,716) was due to an increase in the two items, salaries of department managers and salaries of salesmen. Had these salaries not been increased so sharply in 1919 and remained practically constant thereafter, it is more than possible that 1920 would have shown some net profit in spite of the sharp shrinkage in gross profit for that year.

Here is an important discovery which previous methods of analysis failed to indicate sharply.

Classification.—A survey of modern practice shows little uniformity in methods of classifying profit and loss statements, particularly in the division of operating expenses.

Some corporations fully departmentalize all the operating expenses by assigning to departmental accounts all direct departmental charges and then prorating general charges to such departmental accounts.

Other companies partially departmentalize their expenses, i.e., make direct charges to departmental accounts, but do not distribute the indirect charges to those accounts.

Still other companies do not classify their expense accounts departmentally at all.

The matter of expense classification is of particular importance to the public accountant's analysis, for when it appears that the decrease in profits is due to the operating expense factor, he should make an investigation of the details composing the operating expense total and endeavor to locate particular items or departments responsible.

Importance of Trends.—The principal value of this method of analysis lies in the bird's-eye view it gives of the trends of factors influencing net profit.

The same deductions could undoubtedly be drawn from a careful study of the actual figures themselves, but this is an operation which requires considerable time. Furthermore, there is ever present the danger of that detail viewpoint which someone has described as "not being able to see the forest on account of the trees."

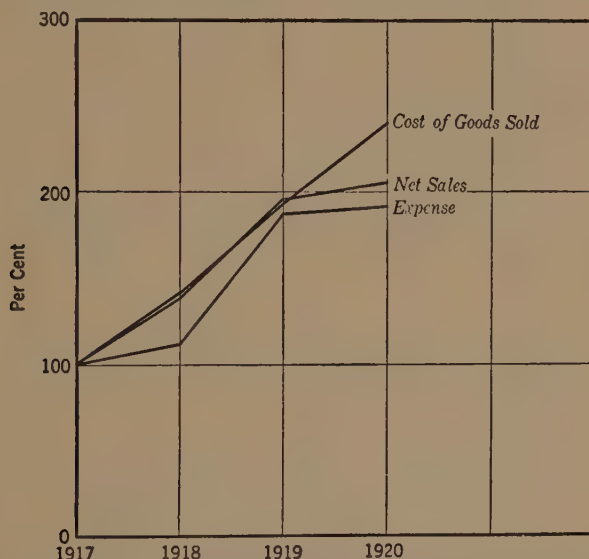


Figure 5. Trend Percentage Chart for the Profit and Loss Statements of Andrews and Company

Charting Trend Percentages.—The trend method of analysis can very well be charted. The chart in Figure 5 shows the trend percentages for Andrews and Company.

The chart visualizes only the trends of the three factors of net sales, cost of goods sold, and expense, and as long as it is clearly understood that this is a percentage chart and a working tool of the analyst, and not an attempt to portray actual figures for the layman, it is invaluable.

It will be found worth while to compare this chart with the actual percentage figures themselves given in a previous table.

In this chart it is the slope of the line which is significant.

For 1919 it will readily be seen that the incline of the expense line is steeper than the line for sales. This is the

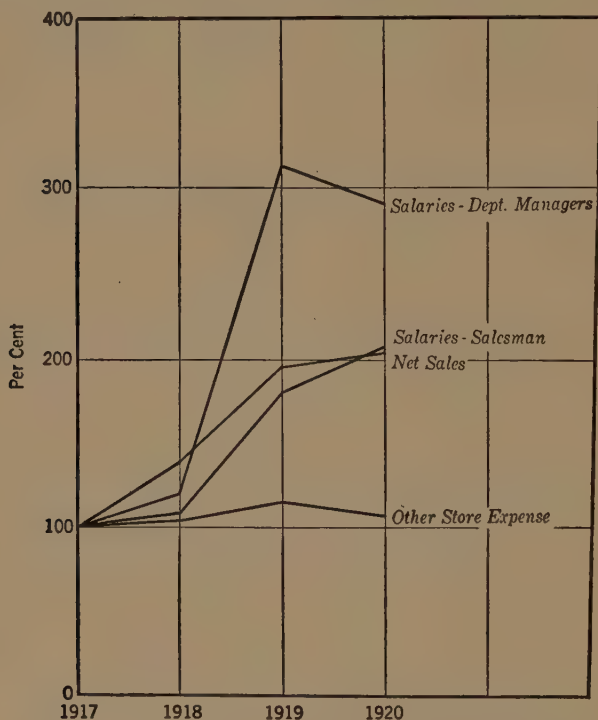


Figure 6. Trend Percentage Chart of Operating Expenses of Andrews and Company

danger signal, since it shows that the expense has increased at a faster rate than the sales. The steepness of the slopes on such a chart show the rate of increase or decrease of the items.

The "operating expense" line should not show a steeper upward slant than the "sales" line. As a general proposition it should show much less of a slope either upward or downward.

Ordinarily it should not be fully responsive to changes in sales volume because it contains fixed and semi-fixed items. The expense line slope in 1918 and 1920 probably represents about a normal rate of increase in operating expense as compared to the rate of increase in sales.

Also, the line representing the "cost of goods sold" should seldom show a steeper upward slant than the line for "net sales." When this occurs, a dangerous trend is indicated.

For those who desire to study the trend of the expense percentages in greater detail, the chart shown in Figure 6 has been prepared. Such a study as this is always valuable when expense as a factor which seems to be responsible for a poor profit showing.

Logarithmic Paper.—For the benefit of those who have been accustomed to analyzing profit and loss figures on logarithmic paper, it might be well to explain that a chart of trend percentage is practically equivalent to a chart on logarithmic paper using the actual figures themselves. This is clearly demonstrated in Figure 7, where the slopes of corresponding lines on the two charts are almost identical.

Logarithmic paper has been popular for years with some accountants for analyzing profit and loss figures. The only reason it is not in general use is because of the current misbelief that charting on logarithmic paper requires a knowledge of advanced mathematics. This is not absolutely true.

Logarithmic paper enables anyone to construct the equivalent of a trend percentage chart without having to figure the percentages, the ruling of the paper itself being so designed as to give an effect similar to that of a trend percentage chart by posting the actual figures themselves.

Importance of Charting Trends.—While the use of logarithmic paper is much quicker, the actual figuring of percentages according to the trend method is not a burdensome task, particularly if a slide rule is used, and the resulting chart is

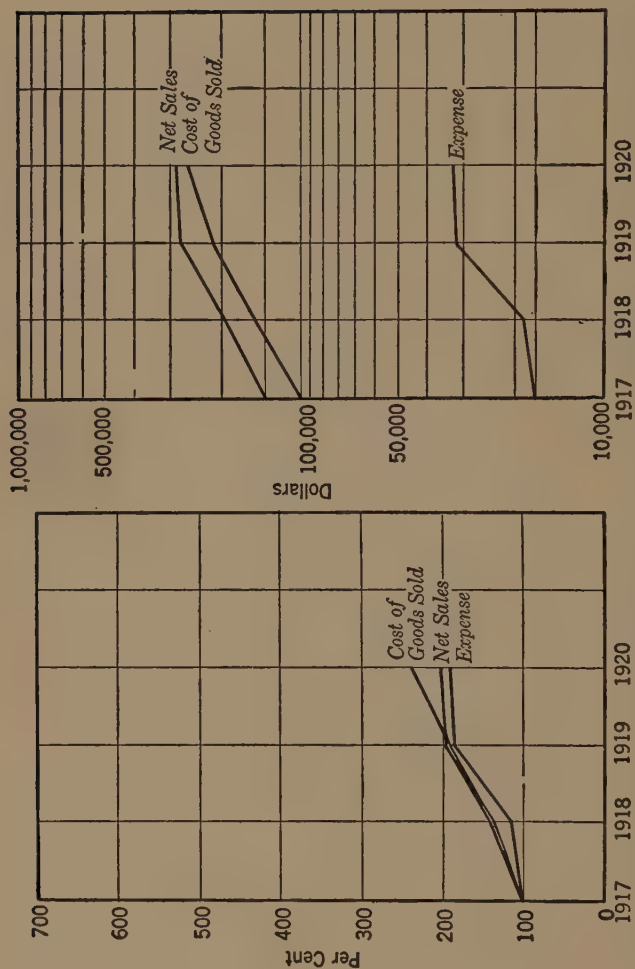


Figure 7. Comparison of Trend Percentage Chart and Logarithmic Chart from Profit and Loss Statements of Andrews and Company.

clearer because all of the three lines start from exactly the same point, i.e., 100%. It is, therefore, easier to compare their slopes.

This charting of the trend percentages is a very important part of the analysis. It may be done quite roughly and still be sufficiently accurate.

It is important, particularly from the administrative viewpoint, because it shows vividly just when dangerous trends started which often fixes a basis for investigating conditions at that time in an attempt to find a remedy.

Variation of Trend Method.—The same purpose could be served by a variation of the trend percentage method which would consider each year (instead of only the first year) as a 100% basis for figuring the percentages of the year following.

The following calculation illustrates the method:

	1917	1918	1919	1920
Actual Sales.....	\$140,161	\$194,324	\$273,040	\$286,445
1918 sales ÷ 1917 sales.....	100%	139%	—	—
1919 sales ÷ 1918 sales.....	—	100%	141%	—
1920 sales ÷ 1919 sales.....	—	—	100%	105%
Actual Cost of Goods Sold.....	\$108,750	\$153,735	\$210,955	\$260,406
1918 C.G.S. ÷ 1917 C.G.S....	100%	141%	—	—
1919 C.G.S. ÷ 1918 C.G.S....	—	100%	137%	—
1920 C.G.S. ÷ 1919 C.G.S....	—	—	100%	123%
Actual Operating Expense.....	\$ 17,055	\$ 18,959	\$ 31,927	\$ 32,640
1918 Exp. ÷ 1917 Exp.....	100%	111%	—	—
1919 Exp. ÷ 1918 Exp.....	—	100%	168%	—
1920 Exp. ÷ 1919 Exp.....	—	—	100%	102%

In shortened form this analysis would appear as follows:

ANDREWS AND COMPANY
ANALYSIS OF TRADING AND PROFIT AND LOSS STATEMENTS
Years Ended December 31

(Each year's percentages based on previous year's figures as 100%.)

	1917	1918	1919	1920
Net Sales.....	\$140,161	139%	141%	105%
Cost of Goods Sold.....	108,750	141	137	123
Operating Expense.....	17,055	111	168	102

These figures clearly indicate that the big jump in operating expense occurred in 1919 and that the increase of 1920 over 1919 was apparently normal. They show that disproportionate increases in cost of goods sold occurred in 1918 and 1920.

But the graphic chart of the trend percentages shows the same facts just as vividly and eliminates the need for this rather complicated calculation, which may be confusing to interpret and very difficult to explain to the non-technical man.

Second Illustrative Case.—The following illustration further demonstrates the trend method of analysis:

KNIGHT HARDWARE COMPANY				
COMPARATIVE TRADING AND PROFIT AND LOSS STATEMENT				
Years Ended December 31				
	1920	1921	1922	1923
Net Sales.....	<u>\$53,842</u>	<u>\$58,738</u>	<u>\$66,059</u>	<u>\$42,710</u>
COST OF GOODS SOLD:				
Inventory Beginning.....	\$15,856	\$14,139	\$12,347	\$16,006
Purchases.....	40,058	44,155	55,272	29,947
	<u>\$55,914</u>	<u>\$58,294</u>	<u>\$67,619</u>	<u>\$45,953</u>
Less Inventory End.....	14,138	12,346	16,006	13,271
Cost of Goods Sold.....	<u>\$41,776</u>	<u>\$45,948</u>	<u>\$51,613</u>	<u>\$32,682</u>
Gross Profit.....	<u>\$12,066</u>	<u>\$12,790</u>	<u>\$14,446</u>	<u>\$10,028</u>
GENERAL ADMINISTRATIVE AND SELLING EXPENSE:				
Salaries and Wages.....	\$ 2,441	\$ 5,180	\$ 4,447	\$ 3,920
Donations.....	37	36	12	28
Advertising.....	44	283	198	16
Telephone, Telegraph and Postage.....	90	101	94	109
Printing and Stationery.....	26	19	65	60
Insurance.....	81	97	735	246
Miscellaneous Expense.....	10	2	85	37
Repairs on Stores and Equipment.....	3	—	23	59
Truck and Delivery Expense.....	39	119	263	314
Taxes.....	147	343	456	243
Light, Heat and Water.....	48	60	61	89
Rent.....	664	629	692	793
Freight and Express.....	907	1,002	1,225	1,094
Depreciation.....	112	244	245	245
Subscriptions and Dues.....	5	2	6	10
Traveling Expense.....	—	5	—	—
Bad Debts.....	494	552	447	31
Collection Expense.....	5	3	17	12
Legal and Auditing.....	—	25	—	178
Loss by Theft.....	—	—	—	42
Total.....	<u>\$ 5,153</u>	<u>\$ 8,702</u>	<u>\$ 9,071</u>	<u>\$ 7,526</u>
Net Operating Profit.....	<u>\$ 6,913</u>	<u>\$ 4,088</u>	<u>\$ 5,375</u>	<u>\$ 2,502</u>

OTHER INCOME:

Interest Earned.....	—	—	\$ 7	\$ 23
Discounts Earned.....	\$ 541	\$ 522	775	475
Miscellaneous Income.....	—	—	6	—
Bad Debts Collected.....	—	—	162	—
	<u>\$ 7,454</u>	<u>\$ 4,610</u>	<u>\$ 6,325</u>	<u>\$ 3,000</u>

OTHER EXPENSE:

Interest Paid.....	\$ 87	\$ 147	\$ 471	\$ 612
Discounts Lost.....	—	—	111	—
	<u>\$ 87</u>	<u>\$ 147</u>	<u>\$ 582</u>	<u>\$ 612</u>

Net Profit.....	<u>\$ 7,367</u>	<u>\$ 4,463</u>	<u>\$ 5,743</u>	<u>\$ 2,388</u>
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KNIGHT HARDWARE COMPANY

SUMMARY COMPARATIVE TRADING AND PROFIT AND LOSS STATEMENT

For Years Ended December 31

	1920		1921		1922		1923	
	Amount	%	Amount	%	Amount	%	Amount	%
Net Sales.....	\$53,842	100	\$58,738	100	\$66,059	100	\$42,710	100
Cost of Goods Sold.....	41,776	78	45,948	78	51,613	78	32,682	77
Gross Profit.....	\$12,066	22	\$12,790	22	\$14,446	22	\$10,028	23
Operating Expense.....	5,153	9	8,702	15	9,071	14	7,526	17
Net Operating Profit.....	<u>\$ 6,913</u>	13	<u>\$ 4,088</u>	7	<u>\$ 5,375</u>	8	<u>\$ 2,502</u>	6

KNIGHT HARDWARE COMPANY

ANALYSIS OF TRADING AND PROFIT AND LOSS STATEMENTS

For Years Ended December 31

(Trend method.)

	1920	1921	1922	1923
	Amount	Percentage of 1920	Percentage of 1920	Percentage of 1920
Net Sales.....	\$53,842	109	122	79
Cost of Goods Sold.....	41,776	110	124	78
Gross Profit.....	\$12,066	—	—	—
Operating Expense.....	5,153	169	176	146
Net Operating Profit.....	<u>\$ 6,913</u>	—	—	—

This typifies a common situation where sales keep on increasing over a period of years and then suddenly slump. The prosperous feeling engendered by increasing sales causes relaxation of watchfulness in connection with the expense items, which often grow out of all proportion to the increase in sales. When sales decrease, expense is usually difficult to influence downwards with the result that the profit is greatly reduced.

Interpretation of Statement.—This appears to have happened with the Knight Hardware Company.

The actual cause of the very poor profit situation in 1923 was due in large part to the heavy rise in expense two years previously. This is clear from an inspection of the chart in Figure 8. An increase in expense to 169% in 1921 as compared with an increase in sales to only 109% seems out of line on the face of it.

There was apparently some attempt made at expense reduction in 1923, but it was not at a rate sufficient to equal the rate of drop in sales. The trends of sales and cost of goods sold seem fairly uniform throughout.

The trend method may, in this instance, be applied to some of the details composing the operating expense.

KNIGHT HARDWARE COMPANY
ANALYSIS OF OPERATING EXPENSE
For Years Ended December 31

	1920	1921	1922	1923
	Amount	Percentage of 1920	Percentage of 1920	Percentage of 1920
Salaries and Wages.....	\$2,441	212	182	161
Rent.....	664	95	104	119
Freight and Express.....	907	110	135	121
Other Expenses.....	<u>1,141</u>	<u>166</u>	<u>237</u>	<u>151</u>
Total.....	<u>\$5,153</u>	<u>169</u>	<u>176</u>	<u>146</u>

While the chief responsibility for the trend of expense probably rests on the item of salaries and wages, an upward tendency is noted throughout the above statement. This is reflected in the chart shown in Figure 9.

Third Illustration.—As a third illustration of the use of the trend method in profit and loss statement analysis, a summary statement of the Ames Manufacturing Company is presented. It will be recalled that the Ames Manufacturing Company is an actual company, disguised for the purposes of illus-

tration by changing the dates of the statements and the corporate name.

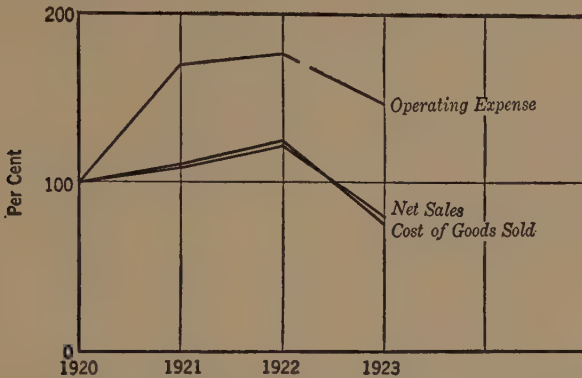


Figure 8. Trend Percentage Chart of Profit and Loss Statements of the Knight Hardware Company

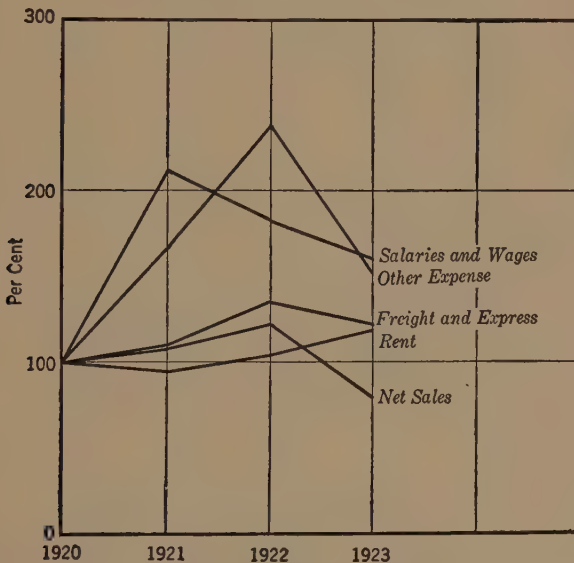


Figure 9. Trend Percentage Chart of Operating Expenses of the Knight Hardware Company

Because this statement is in a highly summarized form it does not offer the interesting analytical possibilities that the

other two statements did. Nevertheless, because its balance sheet was analyzed in Chapters IX and XI, the profit and loss figures are shown here for completeness.

THE AMES MANUFACTURING COMPANY
COMPARATIVE PROFIT AND LOSS STATEMENT
For Years Ended January 1

	1921		1922		1923		1924	
Net Sales.....	\$52,088	100%	\$66,383	100%	\$90,652	100%	\$96,691	100%
Cost of Goods Sold and								
Operating Expense..	<u>42,270</u>	<u>81</u>	<u>55,100</u>	<u>83</u>	<u>78,521</u>	<u>87</u>	<u>84,158</u>	<u>87</u>
Operating Net Profit..	<u>\$ 9,818</u>	<u>19%</u>	<u>\$11,283</u>	<u>17%</u>	<u>\$12,131</u>	<u>13%</u>	<u>\$12,533</u>	<u>13%</u>

For simplicity, non-operating income and expense are not shown.

Very little can be done toward analyzing the factors influencing the decreasing ratio of profits to sales because no division is made between cost of goods sold and operating expense. The last profit figure shown (\$12,533) is 15% of the net worth at the beginning of the year, which cannot be regarded as insufficient.

Because of the nature of the statement, application to it of the trend method can hardly be expected to yield any important information, but for completeness the trend percentages are shown here.

THE AMES MANUFACTURING COMPANY
ANALYSIS OF PROFIT AND LOSS STATEMENTS
For Years Ended January 1
(Trend percentage method.)

	1921	1922	1923	1924
	Amount	Percentage of 1921	Percentage of 1921	Percentage of 1921
Net Sales.....	\$52,088	127	174	186
Cost of Goods Sold and Oper-				
ating Expense.....	<u>42,270</u>	<u>130</u>	<u>186</u>	<u>199</u>
Operating Net Profit.....	<u>\$ 9,818</u>	<u>—</u>	<u>—</u>	<u>—</u>

The figures as charted in Figure 10 clearly indicate that the years 1922 and 1923 are primarily responsible for the decreased

profit showing, the slopes of the two lines for 1924 being practically parallel.

Program of Analysis.—The general philosophy of profit and loss analysis coincides with that of balance sheet analysis. The purpose of the analysis in each instance is twofold:

1. Determine the trends as evidenced by a series of statements.
2. Determine how far the trends have gone by a study of the most recent statement of the series.

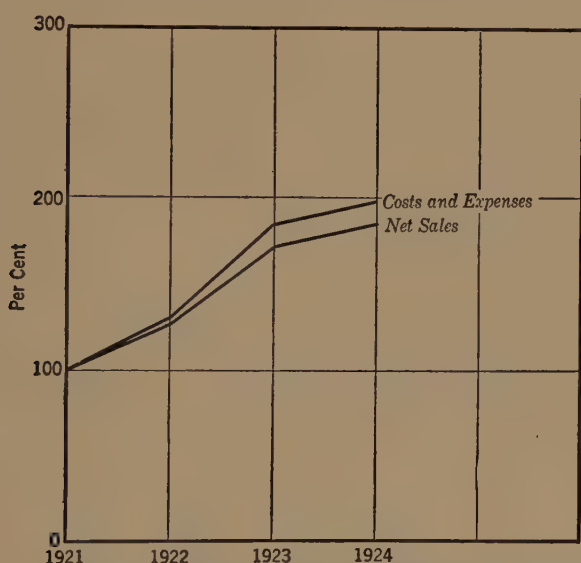


Figure 10. Trend Percentage Chart of Profit and Loss Statements of the Ames Manufacturing Company

When possible, the trend study should go into details, although it should again be noted that details are seldom available to the prospective or actual investor or the credit man.

The second purpose is served by what is equivalent to a ratio study of balance sheets, i.e., by determining the percentages of each principal item in the profit and loss statement to the sales.

The percentage of cost of goods sold to sales, or the "operating ratio," as it is usually called, is such an important figure in any profit and loss statement that many analysts would determine it for each of a series of statements instead of the most recent one. While this is not necessary if a trend study is made and properly interpreted, still no erroneous impressions will be formed thereby.

The greatest usefulness of the trend study lies in the light it throws on the operating expense.

The following minimum analysis procedure is, therefore, recommended for a series of profit and loss statements of a trading business :

1. Determine the percentage of net profit for each year to the net worth at the beginning of the year, or to the average net worth during the year.
2. Study the operating expense trends in as much detail as possible in relation to sales trades, and roughly chart the trend percentages to obtain graphic comparison of slopes.
3. Study the operating ratios for all statements.
4. Observe the operating ratio and the ratio of operating expenses to net sales and the ratio of net profit to net sales for the most recent statement of the series.
5. General scrutiny of statements prior to forming conclusions in order to insure common sense viewpoint.

For a series of manufacturing statements about the same procedure should be followed except that the trend study should be extended to include the labor, material and manufacturing expense elements of the cost of goods sold. This will be more fully set forth in the following chapter.

CHAPTER XVI

PROFIT AND LOSS ANALYSIS (Continued)

Manufacturing Statements.—The profit and loss statements of manufacturing companies differ to some extent from those of trading companies.

Whereas the trading company buys the merchandise which it intends to resell, the manufacturing company produces such merchandise from various raw materials which it purchases. This involves a complete realm of activity which is unknown to the trading company and which introduces new elements into the analytical procedure.

To illustrate the difference in the form of the statements, the following may be taken to represent the first section, down to the gross profit point, of the detailed profit and loss statement of a trading company:

JONES MANUFACTURING COMPANY
TRADING AND PROFIT AND LOSS STATEMENT
For Year Ended December 31, 1920

Net Sales.....	\$525,679
Cost of Goods Sold:	
Inventory at Beginning of Year.....	\$ 77,107
Purchases.....	<u>495,635</u>
Total.....	\$572,742
Less: Inventory Dec. 31.....	<u>104,284</u>
Cost of Goods Sold.....	<u>468,458</u>
Gross Profit.....	<u>\$ 57,221</u>

If the title "Cost of Goods Manufactured" should be substituted in the above statement in place of "Purchases," the statement would then be turned into a statement for a manufacturing business:

JONES MANUFACTURING COMPANY
MANUFACTURING, TRADING AND PROFIT AND LOSS STATEMENT
For Year Ended December 31, 1920

Net Sales.....	\$525,679
Cost of Goods Sold:	
Inventory at Beginning of Year.....	\$ 77,107
<i>Cost of Goods Manufactured</i>	<u>495,635</u>
Total.....	\$572,742
Less: Inventory Dec. 31.....	<u>104,284</u>
Cost of Goods Sold.....	468,458
Gross Profit.....	<u>\$ 57,221</u>

But where one item, "Purchases, \$495,635," represents sufficient information on a trading statement, it must be recognized that the manufacturing procedure which results in the same figure is so important and so complicated that further detail supporting the corresponding item, "Cost of Goods Manufactured, \$495,635," should be had.

Sometimes this is put in the form of a supplementary exhibit as follows:

JONES MANUFACTURING COMPANY
MANUFACTURING STATEMENT
For Year Ended December 31, 1920

Goods in Process, January 1.....	\$ 28,892
Material Used.....	418,610
Freight and Express.....	6,281
Direct Labor.....	<u>48,081</u>
Total.....	\$501,864
Less: Goods in Process Dec. 31.....	<u>33,686</u>
	\$468,178
Manufacturing Expense.....	<u>27,457</u>
Cost of Goods Manufactured.....	<u>\$495,635</u>

This exhibit forms the analytical explanation of the single item, "Cost of Goods Manufactured, \$495,635."

While for explanatory purposes the profit and loss statement and the manufacturing statement of the Jones Manufacturing Company have been shown separately, it is equally good practice to combine the two.

Illustration.—The last column of the following comparative manufacturing, trading and profit and loss statement includes the same figures as those given in the foregoing illustration, except that the figures are exhibited in greater detail and the operating expenses and other items are shown.

This statement is one of an actual company with the name and dates changed, but no changes have been made in the arrangement of the statement.

It appears open to some criticism from the viewpoint of the best modern practice in the presentation of such statements, but this is a matter of slight importance from the viewpoint of the analyst who must usually accept statements as he finds them.

JONES MANUFACTURING COMPANY
COMPARATIVE MANUFACTURING, TRADING AND PROFIT AND LOSS
STATEMENT

Years Ended December 31

	1917	1918	1919	1920
Sales.....	\$372,612	\$508,186	\$469,603	\$526,936
Less: Prepaid Parcel Post.....	273	310	1,153	1,257
	<u>\$372,339</u>	<u>\$507,876</u>	<u>\$468,450</u>	<u>\$525,679</u>
MANUFACTURING:				
Goods in Process.....	\$ 33,083	\$ 29,907	\$ 21,888	\$ 28,892
Material Used.....	269,656	300,053	283,464	418,610
Freight and Express.....	5,464	5,393	6,456	6,281
Direct Labor.....	43,639	45,223	38,798	48,081
	<u>\$351,842</u>	<u>\$380,576</u>	<u>\$350,606</u>	<u>\$501,864</u>
Less: Goods in Process Dec. 31.....	29,908	21,888	28,892	33,686
Prime Cost.....	<u>\$321,934</u>	<u>\$358,688</u>	<u>\$321,714</u>	<u>\$468,178</u>
MANUFACTURING EXPENSE:				
Salaries.....	\$ 10,299	\$ 11,726	\$ 10,378	\$ 11,895
Light.....	484	559	349	671
Power.....	750	1,034	860	731
Fuel.....	926	1,308	860	1,496
Belting.....	166	182	25	57
Needles.....	281	178	55	40
Disinfectants.....	40	32	10	18
Oil.....	33	16	16	11
Miscellaneous Supplies.....	206	540	418	455
New Parts for Machines.....	857	680	502	670
Repairs.....	138	230	177	1,266
Insurance.....	870	983	555	717
Taxes, State, County and City.....	746	1,392	1,509	1,718
Rent.....	2,092	5,680	5,680	6,880
Telephone and Telegraph.....	70	83	68	69

Traveling Expense.....	282	503	342	344
Royalties.....	598	694	640	141
Water.....	52	53	66	60
Depreciation.....	957	769	—	—
Miscellaneous.....	325	177	141	218
Total Manufacturing Expense.....	<u>\$ 20,172</u>	<u>\$ 26,819</u>	<u>\$ 22,651</u>	<u>\$ 27,457</u>
Cost of Goods Manufactured.....	<u>\$342,106</u>	<u>\$385,507</u>	<u>\$344,365</u>	<u>\$495,635</u>
Finished Goods Inventory.....	<u>50,519</u>	<u>102,623</u>	<u>102,847</u>	<u>77,107</u>
	<u>\$392,625</u>	<u>\$488,130</u>	<u>\$447,212</u>	<u>\$572,742</u>
Less: Finished Goods Inventory Dec. 31.....	<u>102,623</u>	<u>102,847</u>	<u>77,107</u>	<u>104,284</u>
Cost of Goods Sold.....	<u>\$290,002</u>	<u>\$385,283</u>	<u>\$370,105</u>	<u>\$468,458</u>
Gross Profit.....	<u>\$ 82,337</u>	<u>\$122,593</u>	<u>\$ 98,345</u>	<u>\$ 57,221</u>

OPERATING EXPENSE:

Delivery and Selling Expense:

Salaries.....	\$ 12,754	\$ 15,079	\$ 15,410	\$ 15,502
Commissions.....	13,609	18,645	20,585	20,861
Traveling Expense.....	2,688	2,485	2,274	2,068
Drayage and Express Outbound.....	433	415	498	915
Rent.....	5	10	10	10
Depreciation.....	160	157	53	52
Light, Heat and Water.....	6	6	6	6
Burlap.....	120	607	30	10
Cases.....	381	415	300	391
Paper.....	347	311	417	174
Rope.....	—	51	72	10
Advertising.....	—	—	—	98
War Tax.....	22	138	139	177
Miscellaneous Expense.....	—	—	3	—
Total.....	<u>\$ 30,525</u>	<u>\$ 38,319</u>	<u>\$ 39,797</u>	<u>\$ 40,274</u>

Administrative Expense:

Salaries.....	\$ 10,328	\$ 11,832	\$ 13,278	\$15,953
Traveling.....	184	522	135	85
Legal and Accounting.....	192	281	172	150
Subscriptions and Dues.....	62	220	173	266
Stationery and Printing.....	351	415	437	359
Bad Debts.....	250	114	312	189
Commercial Agencies.....	290	183	350	290
Collection Expense.....	182	54	86	339
Rent.....	5	10	10	10
Depreciation.....	56	56	66	65
Light, Heat and Water.....	4	4	4	4
Postage.....	529	605	608	471
Telephone and Telegraph.....	163	214	212	216
Total.....	<u>\$ 12,596</u>	<u>\$ 14,510</u>	<u>\$ 15,843</u>	<u>\$18,397</u>
Total Operating Expense.....	<u>\$ 43,121</u>	<u>\$52,829</u>	<u>\$ 55,640</u>	<u>\$58,671</u>
Net Operating Profit (or Loss *).....	<u>\$ 39,216</u>	<u>\$ 69,764</u>	<u>\$ 42,705</u>	<u>\$ 1,450*</u>

OTHER INCOME:

Interest Earned—Notes.....	54	166	2	—
Interest Earned—U. S. Bonds.....	—	895	1,701	784
Discount Earned.....	5,787	7,098	8,082	8,226
Collection Bad Debts.....	—	—	15	2
Rags Sold.....	2,047	1,567	1,182	3,288
	<u>\$ 47,104</u>	<u>\$ 79,490</u>	<u>\$ 53,687</u>	<u>\$10,850</u>

OTHER EXPENSE:

Interest Paid.....	\$ 1,161	\$ 1,175	\$ 435	\$ 381
Interest Paid U. S. Bonds.....	—	—	185	—
Discount Allowed.....	2,382	3,083	3,127	3,415
Exchange.....	156	133	6	2
Federal Income and Capital Stock Tax.....	10,526	44,779	8,654	356
Donations.....	16	401	124	49
Loss on Liberty Bonds.....	—	—	—	2,743
State Income Tax.....	4,464	2,928	1,499	—
	<u>\$ 18,705</u>	<u>\$ 52,499</u>	<u>\$ 14,030</u>	<u>\$ 6,946</u>
Net Profit.....	<u>\$ 28,399</u>	<u>\$ 26,991</u>	<u>\$ 39,657</u>	<u>\$ 3,904</u>

Interpretation of Statement.—The first analysis of this statement will follow the procedure already set forth for trading statements.

JONES MANUFACTURING COMPANY
COMPARATIVE TRADING AND PROFIT AND LOSS STATEMENT
Years Ended December 31

	1917		1918		1919		1920	
	Amount	%	Amount	%	Amount	%	Amount	%
Net Sales.....	\$372,339	100	\$507,876	100	\$468,450	100	\$525,679	100
Cost of Goods Sold.....	290,002	78	385,283	76	370,105	79	468,458	89
Gross Profit.....	\$ 82,337	22	\$122,593	24	\$ 98,345	21	\$ 57,221	11
Operating Expense.....	43,121	12	52,829	10	55,640	12	58,671	11
Net Profit (or Loss*)...	<u>\$ 39,216</u>	<u>10</u>	<u>\$ 69,764</u>	<u>14</u>	<u>\$ 42,705</u>	<u>9</u>	<u>\$ 1,450*</u>	<u>—</u>

JONES MANUFACTURING COMPANY
ANALYSIS OF TRADING AND PROFIT AND LOSS STATEMENT
Years Ended December 31

(Trend percentage method)

	1917	1918	1919	1920
	Amount	Percentage of 1917	Percentage of 1917	Percentage of 1917
Net Sales.....	\$372,339	136	126	141
Cost of Goods Sold.....	290,002	133	127	161
Gross Profit.....	\$ 82,337	—	—	—
Operating Expense.....	43,121	123	129	136
Net Profit (or Loss*).....	<u>\$ 39,216</u>	<u>—</u>	<u>—</u>	<u>—</u>

The year 1918 made a fairly favorable showing but the trends in 1919 were bad, as may be seen in Figure 11.

Cost of goods sold decreased but net sales themselves decreased still more, while operating expense continued its upward climb. The effect of this was felt in 1920—in spite of

an increase in sales to a high point of 141%. Cost of goods sold increased faster, reaching 161%. Expense continued to increase but not at a rate disproportionate to the slope of the sales line.

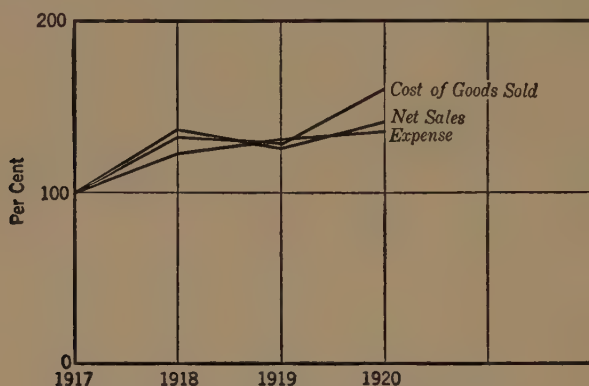


Figure 11. Trend Percentage Chart of Profit and Loss Statements of the Jones Manufacturing Company

These conclusions are obvious from the analytical figures already established. Since further details are available, it should be possible to trace the difficulties more specifically by making a trend analysis of some of the items on the manufacturing statement and of the operating expenses:

JONES MANUFACTURING COMPANY
ANALYSIS OF MANUFACTURING COSTS AND OPERATING EXPENSE
Years Ended December 31

(Trend percentage method.)

Items to Be Analyzed	1917 Amount	1918	1919	1920
		Percentage of 1917	Percentage of 1917	Percentage of 1917
Material Used.....	\$269,656	111	105	155*
Freight and Express.....	5,464	99	118	115*
Direct Labor.....	43,639	104	89	110
Manufacturing Expense.....	20,172	133	112	136
Salaries.....	10,299	114	101	115
Fuel.....	926	141	93	162*
Repairs.....	138	167	128	917*
Taxes.....	746	187	202	230*
Rent.....	2,092	272	272	329*

Operating Expense.....	\$ 43,121	123	129	136
Delivery and Selling Ex-				
pense.....	30,525	125	130	132
Salaries.....	12,754	118	121	122
Commissions.....	13,609	137	151	153*
Traveling Expense.....	2,688	92	84	77
Administrative Expense.....	12,596	115	126	146*
Salaries.....	10,328	115	129	154*

The survey of this detailed trend analysis points to the items marked (*) as being the ones that have increased at a faster rate than sales.

Scrutinizing the amounts on the statement again to deter-

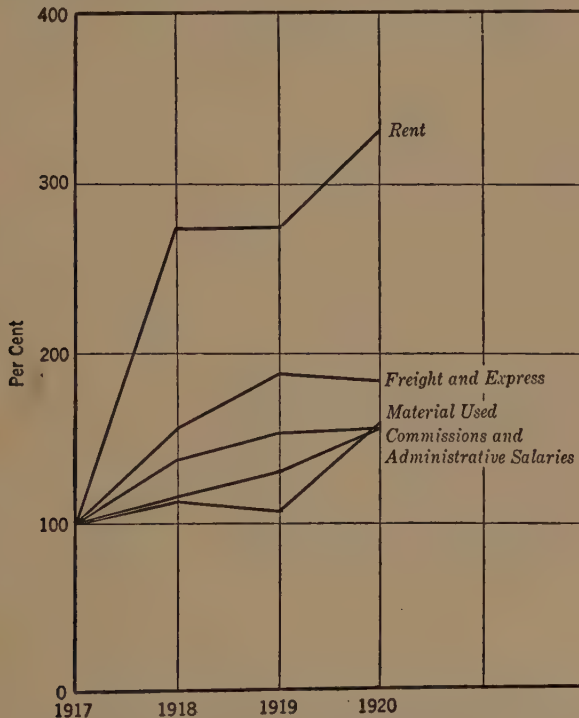


Figure 12. Trend Percentage Chart of Selected Items of Manufacturing Cost and Operating Expenses of the Jones Manufacturing Company

mine the relative importance of these various items, it is found that material used overshadows all of the others.

As seen in the chart in Figure 12, the trend of the labor cost appears quite reasonable. The trend of manufacturing expense in total seems high, although it has not increased at as fast a rate as sales. Certain of the items in the manufacturing expense group, particularly, rent and taxes, are responsible for the trend which would have been much more unfavorable had not the substantial item of salaries been kept down to a reasonable increase.

The operating expense group shows a more rapid increase than would appear proper, and yet as a total it does not appear to have accelerated at a dangerous rate. Acceleration would have been less rapid had the increase in sales commissions not been completely out of proportion with the increase in sales. Also there would have been a better showing had administrative salaries been controlled more carefully.

Using the Trend Analysis.—This method of detailed trend analysis enables one to pick definitely the items which are responsible for a poor showing. That this can be done practically at a glance is, of course, a most valuable feature.

The mental process involved in scrutinizing the statement allows, first, the noting of trend percentages that are out of line and then mentally evaluating the importance of each factor by reference to the actual amounts.

Thus an increase in an expense from \$1 to \$5 represents a trend percentage of 500%, whereas an item increasing from \$10,000 to \$12,000 represents a trend increase to only 120%. And yet one involves an increase of but \$4, while the other increase amounts to \$2,000. Merely to consider trend percentages alone would lead to absurd conclusions. It is the combination of the scrutiny of the trend percentages with the relative importance of the actual items themselves that comprises the complete procedure.

Importance of Expense Trends.—In studying the statements of trading organizations it was observed that the greatest menace to net profit is the inflexible character of certain of the fixed operating expenses and that it was the normal tendency for cost of goods sold to keep a fairly uniform relationship to sales.

In the manufacturing statement there are fixed items to be found in both the operating expense group and the manufacturing expense group. In this type of statement, therefore, it is important that a special study should be made of both classes of expenses.

Material and Labor Costs.—Material costs and labor costs are usually fairly uniform in their relationship to sales, although the statement of the Jones Manufacturing Company represents a violent exception.

Usually where the cost of goods sold in a manufacturing business shows an upward trend as compared to sales, the trouble can be pretty definitely traced to the manufacturing expense group. This is because such expenses usually contain a large proportion of fixed or practically fixed items.

Availability of Detailed Figures.—It should, of course, be understood here, as in previous examples, that it is unusual for the analyst to find as much detail for his study as is shown for the Jones Manufacturing Company.

Published statements are usually in summary form and those furnished to commercial agencies are often in no greater detail, so that the analyst can usually make no more intensive study of a manufacturing company's statement than he can of a trading organization.

However, the public accountant or financial executive does have access to the detailed figures of his client or employer, and will often find that valuable information may be gained from detailed trend studies.

Analyzing Non-Trading Companies.—The profit and loss statements of non-trading companies, such as banks, public utilities, etc., may be analyzed according to the same general procedure as has already been outlined.

The fact that non-trading organizations use different methods of grouping items on their profit and loss statements is a mere detail. The analyst who undertakes this task must keep in mind the two fundamental principles:

1. Trend study.
2. Scrutiny of the composition of the most recent statement.

Public Utility Statement.—This is well illustrated by the following brief analysis of the statement of a large gas company:

SOUTHERN GAS COMPANY
COMPARATIVE PROFIT AND LOSS STATEMENT
Years Ended December 31

	1921	1922	1923
Gross Earnings.....	\$4,268,335	\$5,739,154	\$7,349,607
Operating Expense and Taxes.....	3,151,534	4,208,089	5,285,645
Net Earnings.....	\$1,116,801	\$1,531,065	\$2,063,962
Other Income.....	38,294	50,336	54,393
Total Net Income.....	\$1,155,095	\$1,581,401	\$2,118,355
Fixed Charges.....	392,882	534,274	687,155
Balance.....	\$ 762,213	\$1,047,127	\$1,431,200
Depreciation.....	209,099	295,600	380,704
Surplus.....	<u>\$ 553,114</u>	<u>\$ 751,527</u>	<u>\$1,050,496</u>

In the statement of any public utility company, there are two items of special importance. These are depreciation and fixed charges.

For this reason they are usually exhibited separately and not included among operating expenses and taxes.

It is, of course, a commonplace of accounting that depreciation is as much an operating expense as salaries and wages, and in industrial profit and loss statements it is regarded as

erroneous not to show depreciation in the operating expense group.

The fixed charges which represent interest on bonded indebtedness are ordinarily considered by the accountant to represent non-operating expenses, or as sometimes called, financial expense, in industrial statements.

Because these items are important in public utility statements, they are exhibited separately.

Many accountants may take exception to some of the terminology used. The most glaring misnomer is that of net earnings which is shown before deducting depreciation and fixed charges, but it is customary to sanction this usage in connection with public utility statements. In any event the form above given is the one substantially adopted and must therefore be accepted.

The first step in the analysis is a trend study:

SOUTHERN GAS COMPANY
ANALYSIS OF PROFIT AND LOSS STATEMENTS
Years Ended December 31
(Trend percentage method.)

		1921	1922	1923
	1921	% of	Percentage	Percentage
	Amount	1921	of 1921	of 1921
Gross Earnings.....	\$4,268,335	100	134	172
Operating Expenses and Taxes...	<u>3,151,534</u>	100	134	168
Net Earnings.....	\$1,116,801	—	—	—
Other Income.....	<u>38,294</u>	100	131	142
Total Net Income.....	\$1,155,095	—	—	—
Fixed Charges.....	<u>392,882</u>	100	136	175
Balance.....	\$ 762,213	—	—	—
Depreciation.....	<u>209,099</u>	100	141	182
Surplus.....	<u>\$ 553,114</u>	—	—	—

Interpretation of Statement.—With but minor exceptions, the trends as charted in Figure 13 seem entirely satisfactory and harmonious one to the other.

The sales have increased nicely. Operating expenses and taxes have increased, but not so fast. The fixed charges and depreciation have increased slightly faster than gross earnings, but not sufficiently to represent a warning of danger.

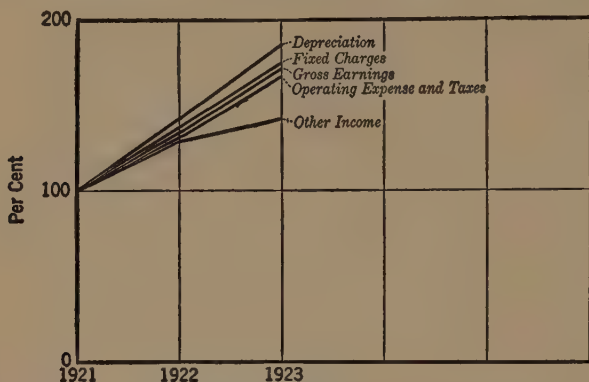


Figure 13. Trend Percentage Chart of the Profit and Loss Statements of the Southern Gas Company

The next step is to scrutinize the latest statement of the company which may be done by a percentage study of the 1923 statement.

SOUTHERN GAS COMPANY
PROFIT AND LOSS STATEMENT
Year Ended December 31, 1923

Gross Earnings.....	\$7,349,607	100.0% ¹
Operating Expenses and Taxes.....	5,285,645	72.0 ¹
Net Earnings.....	\$2,063,962	28.0% ¹
Other Income.....	54,393	—
Total Net Income.....	\$2,118,355	—
Fixed Charges.....	687,155	5.8 ²
Balance.....	\$1,431,200	—
Depreciation.....	380,704	1.7 ³
Surplus.....	\$1,050,496	14.0 ⁴

The percentages marked (1) are based on gross earnings as 100%. The item marked (2) represents the percentage of fixed charges to the total amount of notes and bonds as shown on this company's balance sheet. The item marked (3) rep-

resents the percentage obtained by dividing depreciation by fixed assets as shown by the balance sheet. The item marked (4) represents the percentage of surplus net earnings to the sum of gross earnings plus other income (\$7,349,607 plus \$54,393, which equals \$7,404,000).

Another percentage which should be calculated represents the percentage which surplus earnings bear to the total net worth of the company. This percentage is 11% (not shown above).

For the benefit of those who wish to make a further study of these figures, attention is called to the fact that a summary balance sheet of this company together with statistics, appeared in Chapter XII.

The operating ratio has already been discussed and is considered by many analysts as a most important percentage calculation. This operating ratio can be determined for practically any kind of a profit and loss statement.

The Margin of Safety.—The profit and loss statements of companies the nature of whose business permits a large bonded indebtedness, are also subject to a further ratio calculation which is usually called the “margin of safety.”

This margin of safety attempts to show the relationship between the fixed interest charges and the income available to meet such charges. It is a ratio which is universally used in the Moody Financial Manuals, and investors have learned to look upon it as a very significant figure.

This percentage is obtained by dividing the total net income before deducting fixed charges into the balance which is left after deducting fixed charges. In the Gas Company statement above this works out as follows: \$1,431,200 divided by \$2,118,355 equals 68%.

This ratio is considered of such importance by investment authorities that it is usually published in the financial manuals right along with the profit and loss statements.

The bonds of a company showing no great fluctuation in margin of safety from year to year are a better purchase than those of a less stable nature.

Where the margin of safety is increasing each year, the investment appears more attractive than if the margin of safety stays stationary or decreases.

The margin of safety is a ratio interesting primarily to bond buyers, and therefore, should be classified as a special instrument of analysis rather than one of universal application.

Net Profits per Share of Stock.—Another ratio popular with investors is “net profits per share of stock outstanding.”

This is obtained by dividing the net profits (less the amount of preferred dividends) by the number of shares of common capital stock outstanding at the end of the year. It affords a good check on the stock market quotations, but as a general tool of analysis, it possesses little merit.

Efforts at Establishing Standard Ratios.—As intimated in a preceding chapter, considerable effort has been expended in attempting to work out standard profit and loss statements for concerns in the same line of business.

The most note-worthy attempts along this line have been the studies by Harvard University and Northwestern University.

HARVARD BUREAU OF BUSINESS RESEARCH.—For a number of years Harvard University, through its Bureau of Business Research of the Graduate School of Business Administration, has been studying the problems of the following:

- Retail shoe business
- Wholesale shoe business
- Department stores
- Wholesale groceries
- Retail groceries
- Retail hardware business

Retail jewelers

Retail drug stores

The Bureau has issued more than 30 bulletins on these lines of business.

It is probable that the work they have done on profit and loss statements is far more useful than any which has been done looking toward standard balance sheet ratios.

The reason lies in the fact that early in their research program, they recognized the importance of the uniformity of financial statements. By getting in touch with a large number of individual firms in each of the above classes, they succeeded in working out plans of co-operation whereby individual firms adopted standard accounting and statement procedure and made periodical reports to the research bureau.

By insuring uniformity of classification at the source of the figures, the Harvard Bureau avoided a very serious difficulty in connection with standard ratios.

They also adopted an educational campaign among their contributors looking toward better accounting methods, and they continually fostered this by furnishing their important reports gratis to contributing members.

It is difficult to tell from their published reports just how accurately the ratios picture the facts, because while they publish the number of firms reporting, they give only the modal averages, or common ratios, for the entire group in each classification. This gives no indication how closely the individual ratios cluster to the average, and until that is known, it is difficult to pass an opinion as to the usefulness of the average as a guide.

In some instances they do show high and low percentages in addition to the modal or common average, and these appear to indicate in many divisions a rather close grouping of the items.

NORTHWESTERN BUREAU OF BUSINESS RESEARCH.—The Bureau of Business Research of Northwestern University has been concentrating its attention on three industries: Printing industry, retail clothiers and retail meat industry.

Two bulletins have been issued on the first, 10 on the second, and 10 on the third. Reports of this bureau are given in considerably greater detail than those of the Harvard Bureau. Their most recent study has to do with retail clothiers, which gives an analysis for seven years of sales and expenses of 120 retail clothiers. The bureau took particular pains to insure that these stores were properly grouped.

In spite of these precautions there were quite noticeable deviations of individual ratios from the averages.

Since this appears to be quite an important point in judging the value of such averages as an operating guide, the following figures are given representing the ratios of operating expense to sales for the 16 retail clothiers who contributed from towns having a population of 20,000 to 40,000 people.

For convenience in surveying the figures, fractions of 1% have been eliminated.

RATIOS OF OPERATING EXPENSE TO SALES

As Represented by Northwestern University Bureau of Research
For 16 retail Clothiers in 16 cities between 20,000 and 40,000 population, year 1922.

37%	27%	26%	20%
35%	27%	25%	20%
32%	27%	25%	15%
31%	26%	24%	14%

The modal average or common percentage for the above table is close to 25%, but it will be seen that there are quite wide deviations from this figure. Had the individual percentages been more closely grouped about the average, it would appear that the average would represent a safer guide to any individual retailer who desired to use it as a standard.

Practicability of Profit and Loss Ratios.—There can be little doubt that the standard ratio is theoretically more feas-

ible in connection with profit and loss statements than it is with balance sheets, but there is grave question whether in either instance the standard ratio is an effective tool of analysis.

As the methods of making such standard ratio studies improve and greater uniformity is obtained in account classification and accounting methods, as well as in business policies and other important factors, it is conceivable that the standard ratio may become a more practical instrument for management guidance.

Returned Goods.—Before closing the general subject of profit and loss analysis, there are a few special points that justify brief consideration.

In any analysis of a trading concern the item of returned goods represents an important factor.

It is important not only because of its effect on net profit, but also as an indication of the efficiency of manufacturing operations and selling. It is felt by many that where the figures representing volume of returned goods are available, these figures represent quite a reliable index and that the trend method of analysis should be applied to them in conjunction with the trend study of sales.

It is safe to say that any sharp upward trend in returned goods which is out of harmony with the trend of sales represents a danger signal. This is a point which is probably of greater interest to the public accountant or to executives of a business than it is to investors, credit men or other analysts who seldom have access to such detail figures.

Trend of Operating Statistics.—In Chapter XII it has already been pointed out that interesting sidelights may be thrown on the balance sheet by comparing with the balance sheet trends, the trends of certain operating statistics.

Equal, if not more valuable, information can often be obtained by comparing operating statistics and profit and loss

figures in the same trend analysis. This is illustrated by the following example:

SMITH MINING COMPANY
COMPARATIVE PROFIT AND LOSS STATEMENT
Years Ended March 31
(With Trend Percentages.)

	1921	% of	1922	% of	1923	% of
	Amount	1921	Amount	1921	Amount	1921
Tons of Ore Mined.....	\$ 89,022	100	\$ 84,463	95	\$ 134,801	151
Ounces Silver Produced.....	1,150,963	100	889,778	77	1,553,652	135
Ounces Gold Produced.....	11,324	100	8,845	78	16,254	144
Sales of Bullion.....	\$1,255,321	100	\$989,450	79	\$1,874,718	149
Operating Expenses.....	\$ 973,310	100	\$864,819	89	\$1,295,472	133
Depreciation.....	52,674	—	52,898	—	55,721	—
Net Revenue.....	\$ 229,337	—	\$ 71,733	—	\$ 523,525	—
Interest Earned.....	32,279	—	28,779	—	21,961	—
Net Income.....	\$ 261,616	—	\$100,512	—	\$ 545,486	—
Depletion.....	197,633	100	187,508	95	299,258	151
Net Profit (or Loss*).....	\$ 63,983	—	\$ 86,996*	—	\$ 246,228	—

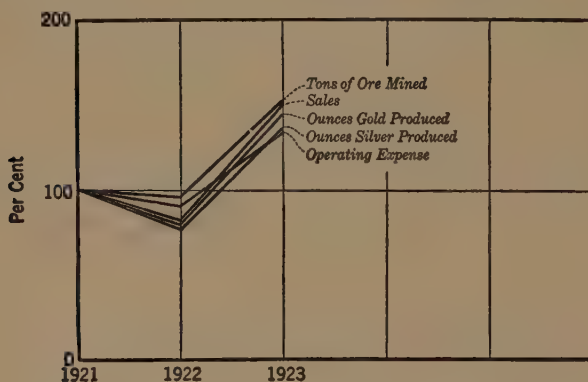


Figure 14. Trend Percentage Chart of Production Statistics and Profit and Loss Figures of the Smith Mining Company

These trend percentages are shown graphically in Figure 14. The fact that the money value of sales increased at a faster rate than the actual physical production of metal in ounces is indicative of a rise in prices.

The discrepancy between the increases in tons of ore mined

and ounces of metal produced would appear to indicate that the ore was becoming leaner in metallic content.

The fact that the trend of operating expenses did not increase as fast as the trends of any of the production figures is favorable in 1923, although less so in 1922.

The item of depreciation is evidently on a fixed basis in its relation to fixed assets, while depletion is arranged on a per ton basis.

The analyst should welcome an opportunity to include in a trend study relevant statistics of this type.

Unsatisfactory Sales Trends.—It often happens that profit and loss trends, particularly sales trends, are apparently unsatisfactory, and the question sometimes arises if such unsatisfactory trends are the result of poor management or of general business conditions.

A partial answer to this question can be had if it is remembered that there are quite a number of so-called "business barometers" with which the sales can be compared. These business barometers represent fundamental statistics. There are a great number of different barometers which have been proposed as being reliable indicators of general business conditions, or of what is technically called the "business cycle."

Such compilations of figures as pig iron prices, bank clearings, interest rates, stock exchange prices, and many others, are used as business barometers.

Business Forecasting Bureaus.—There are also two commercial organizations which conduct business forecasting services. These organizations compile fundamental statistics and then by various means of weighting and combining the statistics produce figures and charts representing general business conditions.

These organizations are the Brookmire Service and the Babson Statistical Organization. In addition there are other

reliable services conducted by the Harvard Economic Bureau and a variety of financial institutions.

Trend of Business Conditions.—Most of these sources furnish reliable figures which can be used to interpret sales trends. This can be done by intelligently selecting a business barometer.

Then, by applying the trend method both to the barometer and sales figures, a series of trend percentages will result which can be compared to each other. If the business barometer was wisely chosen in the beginning, i.e., if common sense indicates that its trends should correspond with the sales trends of the company under analysis, then the unfavorable discrepancies in the sales trends of that company may be due to mismanagement.

An example of this method of analysis is submitted here. The Blank Tire Company is engaged in the manufacture of rubber tires. A survey of its statements indicates a sharp decrease in profits in 1923. A trend study of its sales for three years appears as follows:

Year	Actual Sales	Trend %	Operating Costs and Expenses	Trend %
1921	\$14,690,932	100	\$13,562,272	100
1922	20,487,324	139	18,630,128	137
1923	14,013,832	95	15,178,238	112

Figure 15 shows these percentages graphically.

The insufficient profit is clearly caused by the fact that in 1923 the sales volume decreased at a much more rapid rate than the costs and expenses.

But it is sometimes important to know which was at fault.

The analyst is then often faced with this question. Is this decrease in sales a reasonable decrease? Perhaps general business conditions were responsible for the drop in sales volume. This may be important to know, if a cure for the condition is to be sought.

If the sales decrease is normal, then the cure must be found in the reduction of costs and expenses. If abnormal, the cure must be looked for elsewhere—often in the sales department, the advertising department or the design of the product, etc.

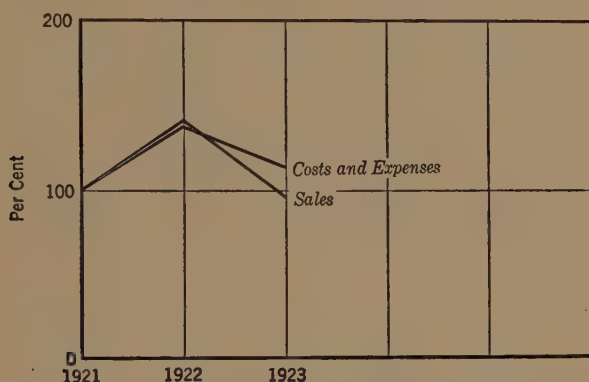


Figure 15. Trend Percentage Chart of Profit and Loss Figures of the Blank Tire Company

Comparison of Trends.—The first step, therefore, is to compare the trend of the sales with the trend of some reliable business barometer.

Probably the best reflection of general business conditions is given by the figures for "bank clearings outside of New York City." These figures are obtainable from a number of different sources, such as financial periodicals and services.

Year	Blank Tire Co. Sales Trend Percentages	Bank Clearings Outside New York Trend Percentages
1921	100	100
1922	140	109
1923	95	130

Both of these sets of percentages are charted in Figure 16.

Since the trend of the bank clearings is consistently upward, it is obvious that the trend of the Blank Tire Company's sales in 1923 is out of line.

But are there peculiarities about the tire manufacturing

business as an industry which make it unreasonable to expect the volume of tires sales to harmonize with the business cycle?

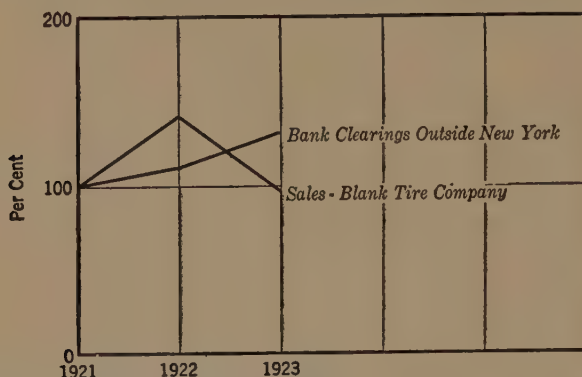


Figure 16. Trend Percentage Chart Comparing Bank Clearings Outside New York with Sales of the Blank Tire Company

That can be answered by investigating the sales trends of other tire manufacturers.

SUNDRY TIRE MANUFACTURERS
STATEMENT OF SALES TREND PERCENTAGES
For the Calendar Years

	1921 Percentage of 1921	1922 Percentage of 1921	1923 Percentage of 1921
Blank Tire Company.....	100	140	95
B. F. Goodrich Company.....	100	108	124
Miller Rubber Company.....	100	120	142
United States Rubber Company.....	100	102	113
Goodyear Tire and Rubber Company..	100	104	108
Firestone Tire and Rubber Company...	100	97	117
General Tire and Rubber Company....	100	135	149

Since the Blank Tire Company is the only one showing a decrease in 1923, the previous conclusion is supported.

The chart in Figure 17 shows all of these trend percentages graphically. In studying them it should be borne in mind that tires are not the only product of some of the companies, but in most instances are conspicuously the principal product.

The comparison of sales trends with general business trends is likely to be most accurate with companies dealing in products widely used and less accurate with companies whose sales are restricted to few customers or a limited geographical area.

The resourceful analyst will usually be able to locate some barometer figures which will be helpful to him when under the restricted conditions mentioned.

Selection of Barometers.—The selection of business barometers to serve as a guide for such analytical work represents a difficult task.

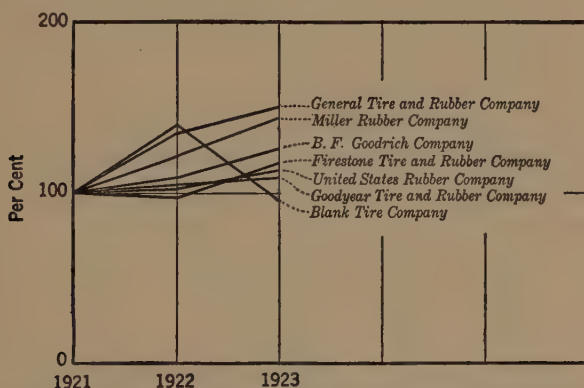


Figure 17. Trend Percentage Chart of Sales of Leading Tire Manufacturers

It is unfortunately true that the trends of all the various business barometers do not absolutely agree, and this may throw a certain amount of doubt on their value to the statement analyst. Nevertheless, if two or more such barometers are subjected to a trend analysis and then intelligently compared with the trend of sales of any given company, it is likely that more light will be thrown on sales fluctuations than if the trade barometer trends had not been used at all.

In dealing with artificial groups of figures, such as business barometers, the analyst is required to use special intelligence and common sense in order to insure fair conclusions. Such

aids represent keen weapons of analysis, but it must be borne in mind that they are dangerous in the hands of the unskilled.

Internal vs. External Viewpoints.—It has been difficult to discuss profit and loss analysis because of the fact that readers have two different viewpoints.

There are those who have the inside viewpoint because of the fact that they are executives of companies who wish to apply analytical methods to the affairs of their own company, or they are public accountants who wish to apply these methods to their client's figures for the purpose of remedying unfavorable conditions. Because they have access to the detailed figures of the company under analysis, they are able to trace unfavorable trends to the very source.

There is another group whose motive is primarily of credit granting. Such an analyst investigates financial statements to determine whether or not credit should be extended. This may be in the form of temporary credit, such as trade or bank credit, or it may be in the form of investment, such as is made by one purchasing stock, bonds or commercial paper.

Thus far in this volume an attempt has been made to keep the requirements of this latter group of readers foremost in mind. Their facilities for making a detailed study is limited, and their analysis procedure with reference to profit and loss statements is usually confined to simple trend studies and a general scrutiny of the interrelationship of items on each most recent statement.

In spite of the fact that an attempt has been made to keep this viewpoint consistently throughout, there have been numerous instances where a more intensive study has been suggested or illustrated. It should be clearly understood that where this has been done, it was for the purpose of offering suggested procedure to analysts of either group who have access to more detailed data than is usually included in published statements.

CHAPTER XVII

USING ANALYSIS METHODS IN REPORTS

The Viewpoint of Some Executives.—While many readers will be interested in analysis methods for their own use, there are perhaps even more who are interested on behalf of someone else.

Thus, the comptroller or auditor of a company is often required to report verbally or in writing upon the results of his work. The public accountant invariably must report to his client. Sometimes the credit man will have to explain his reasons for rejecting a large order by showing just how he reached his conclusions.

It is often difficult for the technical man to explain to the layman just how he forms his conclusions.

In the business world particularly it is observed that some chief executives, particularly those of the old school, have only a very rudimentary knowledge of accounting and business statistics and that they are inclined to be impatient with the technical aspects of accounting.

It, therefore, becomes the duty of a department head in such an organization, or the public accountant serving it, to consider with great care the presentation of reports.

Chief executives, untrained in the uses of accounting, have often graduated into their positions through the sales department or one of the production departments, where they have been accustomed to thinking synthetically rather than analytically, and they often take no pains to conceal their contempt for the "fine spun theories" of an accounting department head or even of their public accountants.

Referring more particularly to the occasional necessity of reporting results of statement analysis, it should first of all be

borne in mind that all the various analysis methods—the whole scheme of analysis technique—is nothing more or less than a technical tool. The executive is, and should be, much more interested in results than he is in the means by which they were accomplished.

Therefore, whenever possible, the analyst should merely formulate his conclusions, test them with common sense, and present them without setting forth the technical methods by which they were reached.

Rules of Reporting.—Unfortunately, it only too often happens that the results of such an analysis represent conclusions which are at variance with the “rule of thumb” opinions of an important executive.

The analyst will then be faced with the necessity of defending his position and he may be forced to answer the question: Just exactly how did you reach these conclusions?

There are two fundamental rules to be followed in presenting a description of technical methods to a layman, particularly where he is in a position of real authority:

1. Avoid technical words and phrases.
2. Build up an explanation which will appeal to the common sense of the layman. It should always be borne in mind that people have contempt for what they do not understand.

With certain types of clients or corporate officers nothing could be more fatal to successfully “selling” an idea than to clothe it with technical words and phrases.

Very few people like to admit ignorance in any form. They will, therefore, frequently pretend to understand a technical explanation, and failing to do so will condemn it as “theoretical.”

Unquestionably there are many successful business men who would not understand as simple a technical word as “ratio.”

Any report, therefore, which attempts to explain to any degree, the methods of financial analysis should be presented in every-day language, and it is well to make sure that the methods are so stated as to appeal to the common sense of the hearer.

Fortunately the more effective methods of statement analysis are not particularly complex.

Thus in presenting a trend analysis of a balance sheet in a public accountant's report, the following form is recommended:

WIRE AND IRON COMPANY
SUMMARY COMPARATIVE BALANCE SHEET
As of December 31

(Together with percentages based upon 1922 figures to indicate the trends of important items, i.e., the rate of increase or decrease.)

	1922		1923		1924	
	Amount	% of 1922	Amount	% of 1922	Amount	% of 1922
<i>Assets</i>						
Cash.....	\$ 6,040	—	\$ 6,375	—	\$ 95	—
Accounts Receivable (Net).....	38,500	100	41,385	107	43,920	114
Quick Assets.....	\$ 44,540	100	\$ 47,760	107	\$ 44,015	99
Inventories.....	94,425	100	122,825	130	72,800	77
Current Assets.....	\$138,965	100	\$170,585	123	\$116,815	84
Fixed Assets.....	113,600	100	127,200	112	117,500	103
Total.....	<u>\$252,565</u>	100	<u>\$297,785</u>	118	<u>\$234,315</u>	93
<i>Liabilities and Capital</i>						
Current Liabilities.....	\$ 37,564	100	\$ 80,704	215	\$104,924	279
Net Worth.....	215,001	100	217,081	101	129,391	60
Total.....	<u>\$252,565</u>	100	<u>\$297,785</u>	118	<u>\$234,315</u>	93

There are four points in connection with this statement which deserve brief discussion:

1. It is not presented as a percentage statement, but as a summary comparative balance sheet, such as is often used without the trend percentages by public accountants in the early pages of their reports. While the real purpose of the above statement is to show the

trends, the method of presentation intentionally covers this purpose.

2. The explanation of the percentages as given in the main heading is an important part of the exhibit.
3. The headings of the percentage columns are also important.
4. Both the amounts and trend percentages should always be shown together. Trend percentages should never be exhibited separately from the amounts, in a report, since a percentage statement alone is often confusing to the layman.

Substitutes for Technical Words.—The phrases “faster rate” and “slower rate” may be used in discussing such a statement, thus: “It would seem apparent from the above percentages that current liabilities are increasing at a faster rate, while net worth is rapidly decreasing. This is a dangerous tendency because”

The words “tendency” and “trend” are not technical words and are usually perfectly intelligible to the layman.

The word “ratio” is one which should practically never be used in a verbal or written report. To the layman it represents something complicated and mathematical. Because he was taught ratio and proportion about the same time that he studied cube root and logarithms, he is inclined to think that the word “ratio” involves “impractical mathematics,” instead of “good business arithmetic.”

It is sometimes a little awkward to dispense with the word “ratio,” since it involves a more roundabout phraseology. Probably the best way to avoid the difficulty is always to discuss ratios in terms of “dollars per dollar,” thus: “In 1921 your company had \$2.59 current assets for every dollar of current liabilities, in 1922 there were \$4.86 current assets for every dollar of current liabilities, while in 1923 there was a drop, with only \$2.50 current assets for every dollar of current liabilities.”

Figuring Percentages.—It is usually unwise to figure percentages too closely.

It is the tendency of accountants to strive for accuracy because the nature of double entry bookkeeping makes absolute accuracy essential. But percentage calculations used in statement analysis need never be figured to a fine point. It is strongly recommended that no fraction of a percentage be shown in any report analyzing financial statements.

The Three Year Analysis.—Finally it appears that there are two good reasons why a statement analysis by the trend method in a report should not cover more than three years:

1. Since it is essential that both amounts and percentages be shown for each year, it would be difficult to put a larger statement on standard $8\frac{1}{2} \times 11$ paper.
2. Great masses of figures confuse the lay mind. When a statement contains more than six columns (three amount columns and three percentage columns), it is too large to be easily grasped and the significance of trends may be lost.

Reports in Summary Form.—It is a commonplace experience of accountants that reports over which they have labored long and carefully are often never read. They are put aside for later attention which they never receive.

Figures may tell a vital story about profits, but the lay mind rejects great compilations of figures and excuses itself on the ground "that they probably don't mean anything anyway." If they were simply presented in summary form with the important elements properly emphasized, they would receive respectful attention.

This is a general observation applicable to all reports which deal with figures, and of course, is equally applicable to that portion of such reports which have to do with this particular subject of analysis.

CHAPTER XVIII

RESTATEMENT OF FUNDAMENTALS OF ANALYSIS

Restatement of Fundamentals.—This volume has attempted to set forth all the commonly recognized methods of analyzing financial statements and has also embodied some procedure which is in advance of general current practice.

Of the various methods proposed, some are good and some are bad; some are effective and some are cumbersome.

Therefore, in order to clarify the entire subject, it seems desirable to restate a few fundamentals:

1. Balance sheets and profit and loss statements available to the analyst are usually not subject to verification, and therefore, must be assumed to be truthful and accurate.
2. A frequent purpose of statement analysis is to determine the desirability or undesirability of extending credit in some form or other, i.e., trade credit, bank credit, or investment. If this is the analyst's purpose, it should be constantly borne in mind by him. It would be absurd to spend time analyzing financial statements of the United States Steel Corporation before deciding as to the wisdom of extending it \$100 credit. It would be equally absurd for the banker to spend time analyzing the financial statements of a corner grocer who is requesting a million-dollar loan. It is usually only in the "border line" cases that analysis procedure need be employed to its full extent.
3. The purpose of statement analysis is to determine:
 - a. Trends.
 - b. Present condition for the purpose of proving or disproving symptoms of each of the five following common business ailments:

- (1) Insufficient profit.
 - (2) Over-investment in receivables.
 - (3) Over-investment in inventories.
 - (4) Over-investment in plant.
 - (5) Insufficient capital.
4. Since conclusions reached through statement analysis usually influence important decisions, involving substantial amounts of money, it is vitally essential that the conclusions be carefully examined in the light of common sense.

Use of Analysis Methods by Executives and Public Accountants.—While this volume has been primarily written for the man who has no access to information supplementing the balance sheet and the profit and loss statement, nevertheless the methods proposed are equally useful to corporate executives or public accountants :

1. For the purpose of giving a bird's-eye view and forming tentative conclusions and for pointing out symptoms to be more thoroughly investigated.
2. For analyzing exhibits, schedules and statements subsidiary to the balance sheets or profit and loss statements.

While but little emphasis has been placed upon special technique required in unusual cases or applicable to special forms of enterprises, it should nevertheless not be overlooked that each type of business has its own peculiarities. The analyst will not be able to adopt a rigid, standardized form of technique, but will sometimes find it necessary to vary his procedure to fit the requirements of unusual situations.

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